



DLP™ Data Display Cube

PH50 series (SXGA+ models)

XL50, XL21 series (XGA models)

Set-up and Installation Manual

March 09, 2007 (REV 2.4)

Table of Contents

1. SET-UP AND INSTALLATION	5
1.1. Overview	5
1.1.1. <i>Product lineup</i>	5
1.1.2. <i>Flowchart</i>	5
Start.....	5
1.2. Cube installation	6
1.2.1. <i>Safety precaution</i>	6
1.2.2. <i>Preparation</i>	6
1.2.3. <i>Input board installation (optional)</i>	7
1.2.4. <i>Unlocking (for XL21)</i>	8
1.2.5. <i>Cube stacking (for Rear)</i>	10
1.2.6. <i>Cube stacking (for Front)</i>	13
1.2.7. <i>Screen open/close (for Front)</i>	21
1.3. Connecting	23
1.3.1. <i>Control signal connection</i>	23
1.3.2. <i>Image signal connection</i>	23
1.3.3. <i>Internal cabling (for Front)</i>	24
1.4. Initial set up	25
1.4.1. <i>Menu operation</i>	25
1.4.2. <i>Dipswitch setting</i>	28
1.4.3. <i>Picture outline adjustment</i>	28
1.5. System memory setting	37
1.5.1. <i>System set up</i>	37
1.5.2. <i>Color balance adjustment</i>	44
1.5.3. <i>Image set up</i>	48
1.6. Input memory setting (for the main input).....	51
1.6.1. <i>Input port selecting</i>	51
1.6.2. <i>Automatic input signal scanning</i>	51
1.6.3. <i>Signal adjustment</i>	52
1.6.4. <i>Image quality adjustment</i>	55
1.6.5. <i>Input memory saving</i>	56
1.6.6. <i>Input memory calling/deleting</i>	56
1.7. Input memory setting (for the input board)	57
1.7.1. <i>Input port selecting</i>	57
1.7.2. <i>Expansion setting</i>	57
1.7.3. <i>Automatic input signal scanning</i>	57
1.7.4. <i>Signal adjustment</i>	58
1.7.5. <i>Image quality adjustment</i>	63
1.7.6. <i>Input memory saving</i>	65
1.7.7. <i>Input memory calling/deleting</i>	65
1.8. Display memory setting (for the input board)	66
1.8.1. <i>INPUT MEMORY</i>	66
1.8.2. <i>H.DISPLAY POS, V.DISPLAY POS</i>	66
1.8.3. <i>CROP</i>	66
1.8.4. <i>DISPLAY</i>	67

1.8.5.	DIGITAL OUT	67
1.8.6.	SCREEN MODE.....	67
1.8.7.	Display memory saving	68
1.8.8.	Display memory calling/deleting	68
1.9.	Setting as daisy chain connection (for the input board).....	69
2.	REGULAR MAINTENANCE.....	71
2.1.	Lamp replacement.....	71
2.1.1.	Safety precautions.....	71
2.1.2.	Procedure.....	72
2.1.3.	Auto-lamp changing function (for Changer).....	78
2.2.	Condenser lens adjustment (for Single)	81
2.3.	Focus adjustment	82
2.4.	Cleaning	83
2.4.1.	Screen front surface	83
2.4.2.	Cabinet.....	83
2.4.3.	Dust filter (for Front).....	83
2.5.	For delivery.....	85
2.5.1.	6-axis adjuster fixing.....	85
2.5.2.	Color wheel locking (for XL21)	85
2.5.3.	Lamp cushion inserting (for XL21 Changer)	85
2.5.4.	Screen-fixing bolt tightening (for 50" Front)	86
2.5.5.	Screen-holding arm locking (for 67" Front)	86
3.	FUNCTION.....	87
3.1.	Memories.....	87
3.2.	Menu trees	87
3.2.1.	Input memory	87
3.2.2.	Display memory.....	88
3.2.3.	System memory	89
3.2.4.	Memory list display.....	90
3.3.	Test pattern list	91
3.4.	Control panel	91
3.5.	LED display	91
3.6.	Terminal functions.....	93
3.6.1.	RS-232C terminal.....	93
3.6.2.	CONTROL terminal.....	93
3.7.	Available input signal list.....	94
3.8.	Motorized adjustment tool, S-AXL50E specification.....	96
3.8.1.	Applicable product.....	96
3.8.2.	Outline drawing	96
3.8.3.	Accessory.....	96
3.8.4.	Terminals.....	97
3.8.5.	Recovery procedure from error.....	98
3.8.6.	Trouble shooting.....	98
4.	ADJUSTMENT SOFTWARE, "WALLABY"	99
4.1.	General.....	99
4.2.	Installation	99

4.2.1.	Software Installation	99
4.2.2.	Connecting	99
4.2.3.	Dipswitch setting.....	99
4.2.4.	Starting the application	99
4.3.	Initial set-up	99
4.3.1.	Model selecting	99
4.3.2.	System configuration setting.....	100
4.3.3.	Panel ID defining	100
4.3.4.	Serial port setting.....	100
4.3.5.	Serial port opening	101
4.3.6.	Turning on	101
4.3.7.	Picture mute off	101
4.3.8.	Data reading.....	101
4.4.	Adjustment	101
4.4.1.	Service tab (for system memory)	102
4.4.2.	Input tab (for input memory)	106
4.4.3.	Display tab (for display memory)	109
4.4.4.	Memory tab	110
4.4.5.	Information tab	110
4.4.6.	Memory copy.....	111
4.5.	Memory backup	112
4.5.1.	Cube data saving.....	112
4.5.2.	Data sending to cubes.....	112
4.6.	Main window.....	113
4.6.1.	Panel selection area	113
4.6.2.	Serial Port	113
4.6.3.	Power and Mute	113
4.6.4.	Information	113
4.7.	Menu bar	114
4.7.1.	File menu	114
4.7.2.	Edit menu	115
4.7.3.	System Config menu	116
4.7.4.	Test Patterns menu	116
4.7.5.	Serial Port menu.....	117
4.7.6.	Special menu.....	117
4.7.7.	Help menu.....	117
5.	ABOUT TRADEMARKS	118
6.	REVISION HISTORY	119



1. Set-up and installation

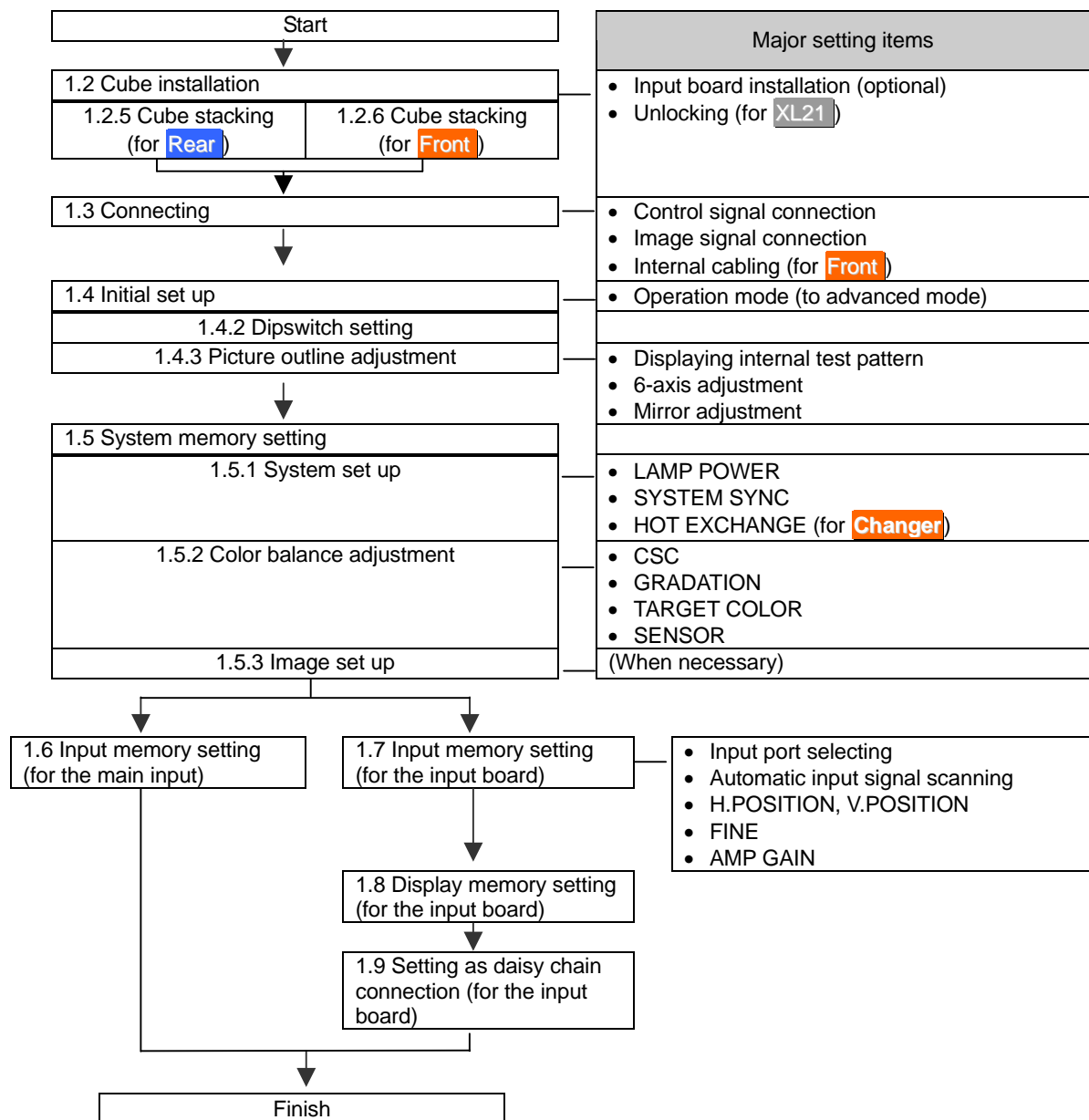
1.1. Overview

1.1.1. Product lineup

Lineup	Resolution	Lamp	Access	Screen size	
				50"	67"
PH50 series	SXGA+	Changer	Front	–	VS-67PHF50U
			Rear	VS-50PH50U	VS-67PH50U
XL50 / (XL21) ^(*) series	XGA	Changer	Front	VS-50XLWF50U	VS-67XLWF50U
			Rear	VS-50XLW50U (VS-50XLW20U)	VS-67XLW50U (VS-67XLW20U)
		Single	Front	VS-50XLF50U (VS-50XLF20U)	VS-67XLF50U
			Rear	VS-50XL50U (VS-50XL21U, VS-50XL20U)	VS-67XL50U (VS-67XL21U, VS-67XL20U)

(*) Parenthesized products are XL21 series.

1.1.2. Flowchart



1.2. Cube installation

1.2.1. Safety precaution

- This product requires a special installation to prevent falling or toppling. This should be done by installation specialists.
- Be sure to read this manual and the user's manual for your safety before starting assembly or installation.
- Be sure to use supplied accessories for assembly or installation.
- Attach all the screws and fixtures specified in this manual securely.
- Reinforce the wall surface and floor so that it can support the total weights of the products for a long time and resist earthquakes, possible vibrations, and external forces.
- Ensure that the safety factor is more than 10 (or ensure that the total bolts can bear ten times the weight of products and the brackets).
- Do not use the product near a heater or in a humid, dusty or smoky location.
- Unless otherwise specified, do not install the product with its intakes, exhaust slots and ventilation holes blocked. The unit may overheat and cause a fire or breakdown.
- Be sure that a lighting or sunlight does not leak into the screens.
- Inspect the mounting fixings more than once in a year as needed.

1.2.2. Preparation

- Before installation, remove the desiccant(s) taped on the top of the product.
- Make sure that all of the following are supplied.

Supplied accessories (per unit)		Q'ty	Necessary tools
1.	Hexagon socket head bolt (M6)	8	1. Allen wrench
2.	Flat washer (for M6)	8	2mm, 2.5mm, 4mm, 5mm
3.	Spring washer (for M6)	8	2. Phillips screwdriver #0, #2
4.	Joint hole seal	1	3. Level
5.	Power cord (1.8m) for North America and Europe (in VS-50XL20U and VS-67XL20U)	2	4. Stepladder
6.	Control cable	1	5. Spacer (for suitable screen gaps)
7.	User's manual	1	6. Wrench (for base stand level adjuster)
8.	Plastic cable tie (for Front)	6 (50"), 10 (67")	
Optional products			Others
1.	Wireless/wired remote control: R-XL50TX		1. Base stand
2.	RGB input board: VC-B50KA (for PH50 , XL50), VC-B20KA (for PH50 , XL21)		2. Base stand level adjuster
3.	Video input board: VC-B50KV (for PH50 , XL50), VC-B20KV (for PH50 , XL21)		3. Base stand level adjuster fixing metal part
4.	Power cord (3m): JC-PC3MA (for North America) JC-PC3ME (for Europe) JC-PC3MC (for China)		4. Wall fixing metal part
5.	External AC fan (for 50" Single Front): JC-AF115R (for AC115V) JC-AF230R (for AC230V)		5. Anchor bolt
6.	Motorized adjustment tool: S-AXL50E		6. Hexagon socket head cap screw (M6)
7.	Spare lamp: S-PH50LA (for Changer) S-XL50LA (for Single)		
8.	Spare color wheel: S-PH50CW (for PH50) S-XL50CW (for XL50), S-XL20CW (for XL21)		

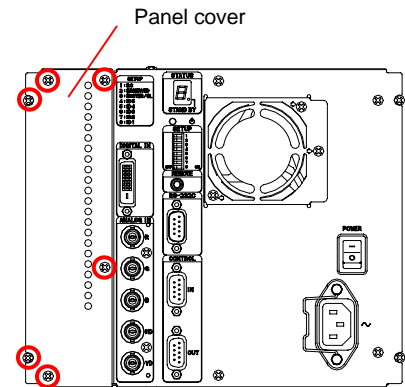
1.2.3. Input board installation (optional)

When using the optional input board, install it into the product according to the following steps.

In **Front**, a slot for the board is located inside the cube. Open the screen unit before installation according to the chapter 1.2.7 on page 21.

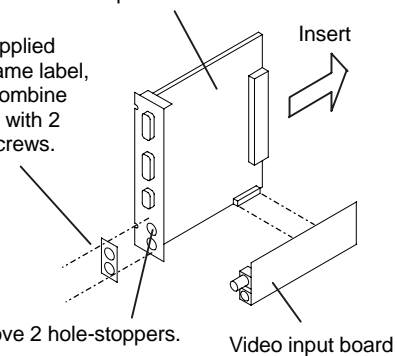
When you attach it, be sure to turn off the main power switch.

1. Remove a panel cover on the control panel by removing 6 screws at the positions shown in the figure.



2. When you use the video input board, attach it as right figure. Stick a supplied terminal name label on the RGB input board, and combine the boards with supplied 2 screws.

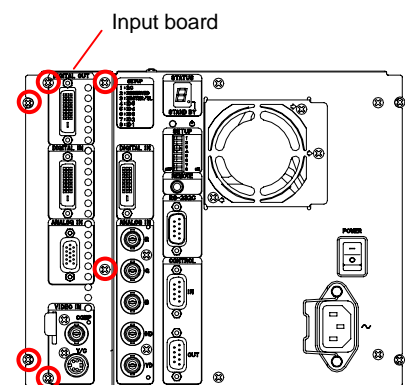
2. Stick the supplied terminal name label, and then combine the boards with 2 supplied screws.



3. Firmly insert the input board into the board slot along guide rails till the end.

1. Remove 2 hole-stoppers.

4. Firmly fix the input board with the 6 screws that have been removed in the step 1.



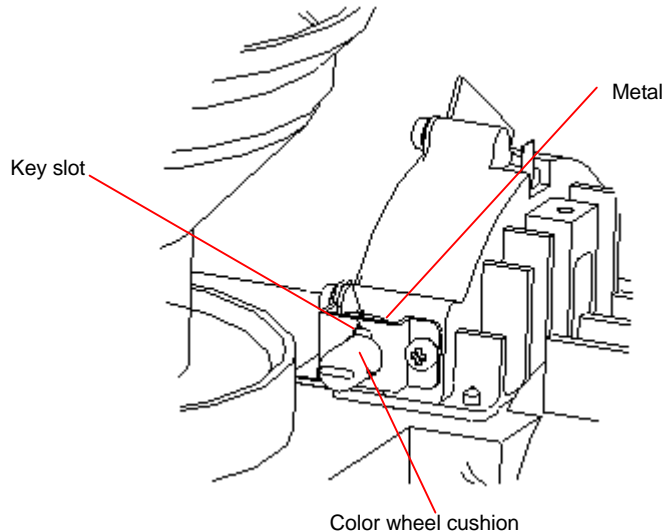
1.2.4. **Unlocking (for XL21)**

Surely release following locks before turning on the main power switch. Turning on without releasing may cause damage.

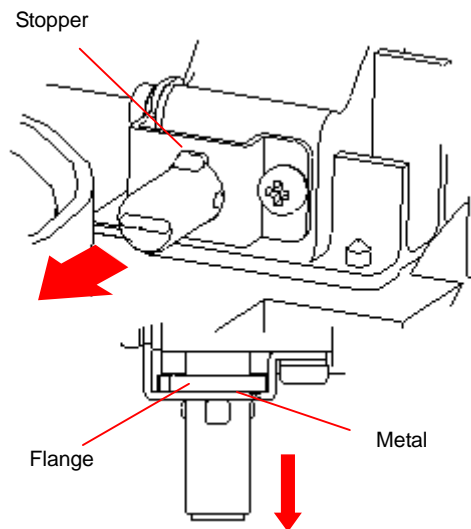
1.2.4.1. **Color wheel unlocking**

The color wheel is located on the optical unit inside the cube. In **Front**, open the screen unit according to the chapter 1.2.7 on page 21 before unlocking. Turning on without unlocking may cause damage.

1. Make sure a key slot on the color wheel cushion faces the top as you begin the procedure.



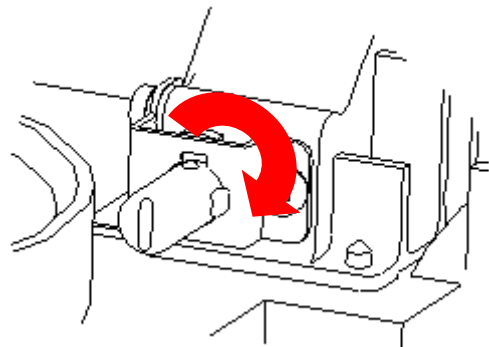
2. Pull the color wheel cushion till the flange hits the metal part.
 - For **Changer**, pliers are recommended to use since it is hard to access with fingers.



3. Turn it 90 degrees clockwise.

Caution

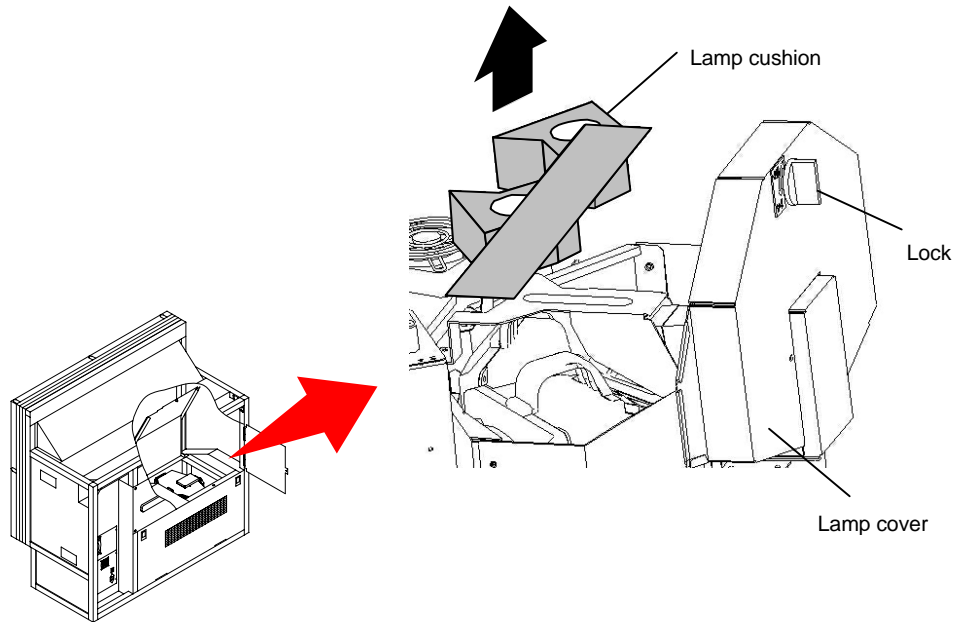
Before shipment, be sure to lock the color wheel in the reverse order of unlocking (chapter 2.5.2, on page 85). Shipping the product without locking may cause breakage.



1.2.4.2. Lamp cushion removing (for **Changer)**

Remove a lamp cushion before turning on the main power switch. Turning on without removing may cause smoking and catching fire.

- It should be remembered to lock the lamp cover after removing. If you neglect to lock it, the lamp changer may not work correctly.

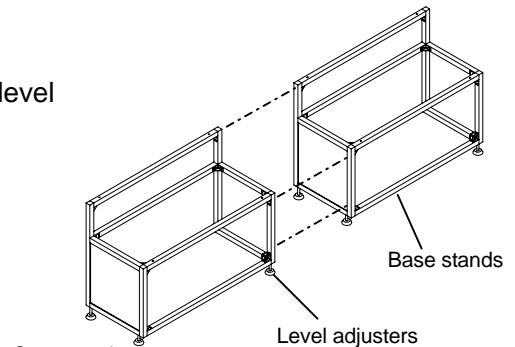


Caution
Before shipment, be sure to insert the cushion in the reverse order of removing (chapter 2.5.3, on page 85). Shipping the product without inserting may cause breakage.

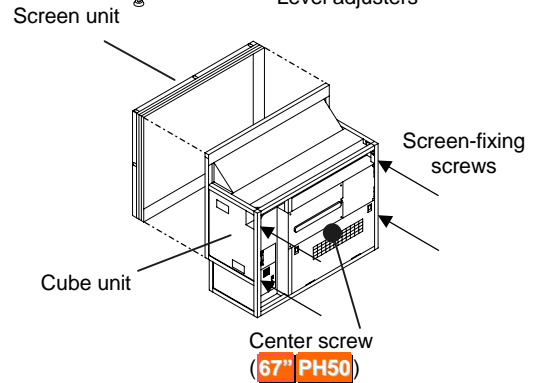
1.2.5. Cube stacking (for **Rear**)

1.2.5.1. Assembling the base stands and cubes

1. Assemble base stands.
2. Adjust level adjusters to make the base stand both level and plumb by means of a spirit level.

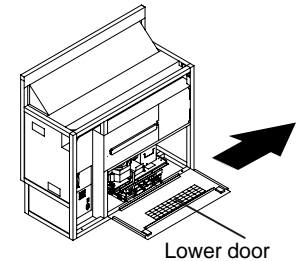


3. Loosen 4 screen-fixing screws per unit shown with arrow lines in the right figure with an Allen wrench (5 mm) to remove the screen units from all cubes to be installed. (This applies to **50"**, which is supplied with the screen fitted).



4. **67" PH50**: Turn a center screw in the lower door 90 degrees anti-clockwise to unlock with an Allen wrench (4mm).

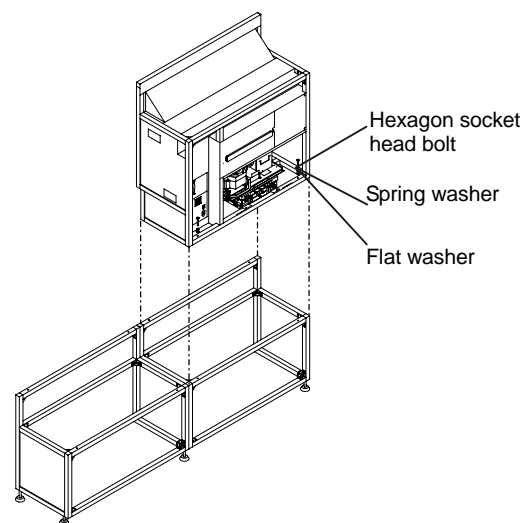
5. Open the lower door 90 degrees by pushing down the handles. And then slide it to right to detach. The door cannot be detached other than 90 degrees opening position.



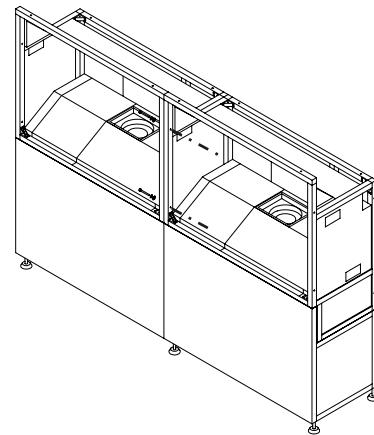
6. Place a cube on the base stand.
7. Fix the cube at 4 points with supplied hexagon socket head bolts, spring washers and flat washers.

Caution

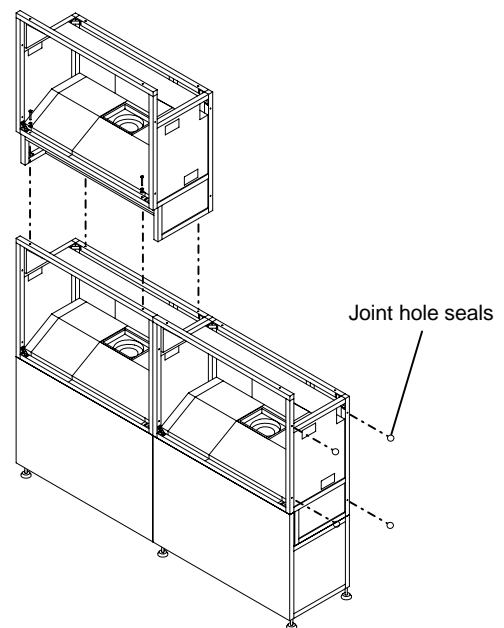
When holding up a cube, be careful not to put your hand between the cube and the base stand.



8. Place the next bottom row cube on the base stand and fix it in the same way.
9. Join right and left cubes at 4 points with supplied hexagon socket head bolts, spring washers and flat washers.



10. Place cubes for the upper row on the assembled units.
11. Fix them vertically and horizontally at 4 points each with supplied hexagon socket head bolts, spring washers and flat washers.
12. Stop up the holes on both sides with supplied joint hole seals, which holes are not used for a display wall.

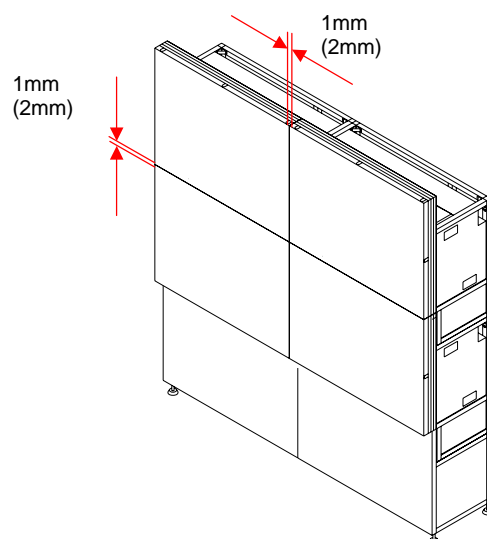


Caution

To avoid units from falling, measure horizontal and vertical degrees with a level etc. to make sure the units are stably assembled.

1.2.5.2. Screen gap adjustment

1. Temporarily attach the screen units, which were detached in the previous step. (For 67-inch models, the screens were supplied separately).
2. Put spacers between screens and adjust the screen gaps to be:
 1 mm for 50" or
 2 mm for 67".
3. Tighten the 4 screen-fixing screws. Be careful not to tighten with an excessive torque (suggested torque: 3.9Nm).

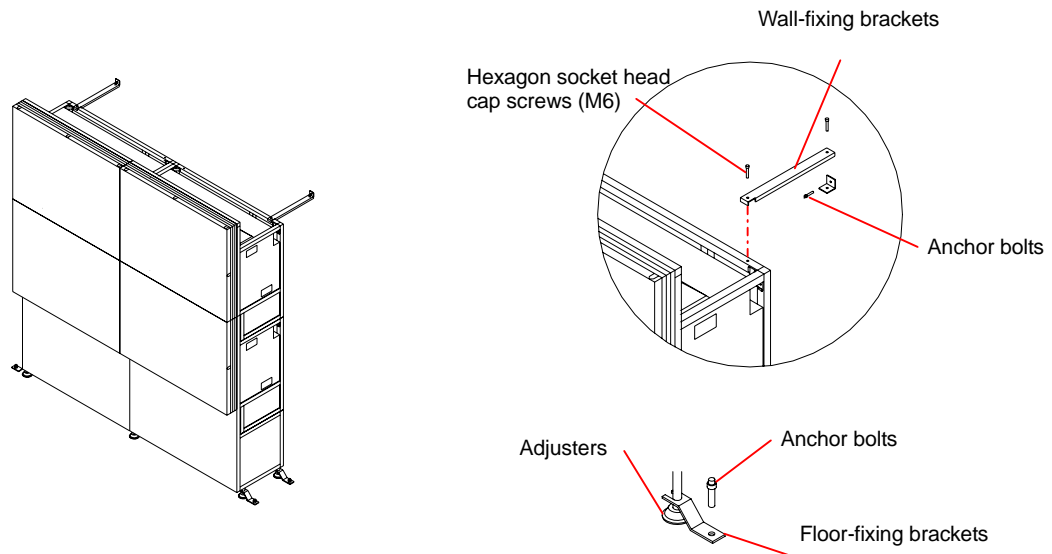


1.2.5.3. Fixing to the wall and floor

You don't have to attach the lower door in this chapter since picture outlines have yet to be adjusted as explained in the next chapter.

After the picture outline adjustment, attach the door in the reverse order of detaching.

1. Attach floor-fixing brackets on 4 level adjusters below the base stand and fix them to the floor with anchor bolts.
2. Fix the upper back part of the display wall to the back wall with wall-fixing brackets as shown in the following figure.



Caution

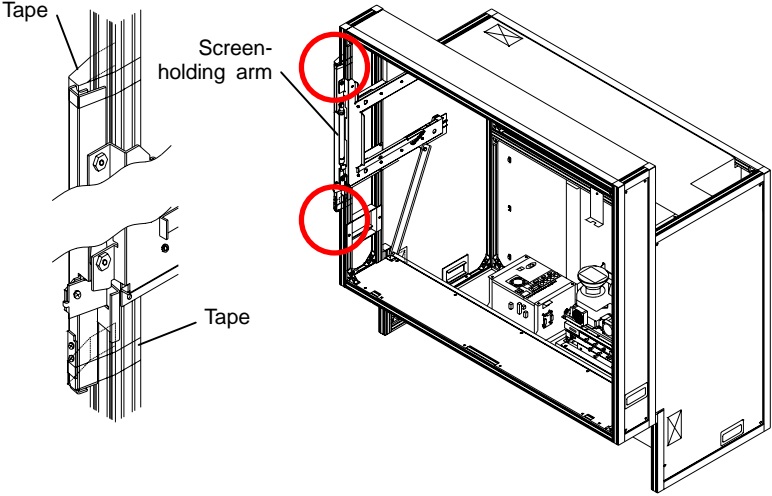
Make sure the whole set is assembled firmly and installed stably. To prevent the set from falling due to unpredictable events such as earthquakes and shocks, fix the set firmly to the wall and floor. Furthermore, carefully confirm the strength of the fixing area of the installation place (wall and floor). The wall and floor fixing method differs according to the number of assembled units.

1.2.6. **Cube stacking (for Front)**

Caution
Take heed of appropriate surrounding space for ventilation (except rear surface) such as not to pool the hot air on the top of the display walls so that the ambient temperature doesn't exceed the product environmental requirements.

1.2.6.1. **Tape peeling off (for 67")**

The screen-holding arms in both sides are taped at each end for transportation. Peel them off before installation.



1.2.6.2. Screen detaching

For **50"** which is supplied with the screen fitted, the screen unit should be detached before installation. (For **67"**, the screens are provided separately.)

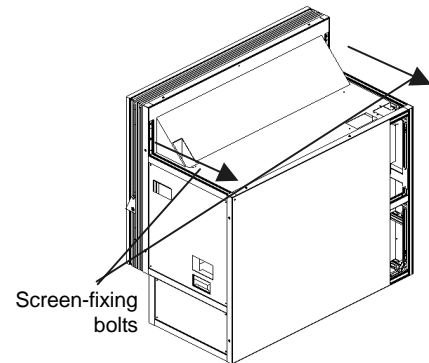
67": Screen attaching/detaching work should be done by two or more people.

Be careful not to trap your fingers when you slide its arms during detaching/attaching work.

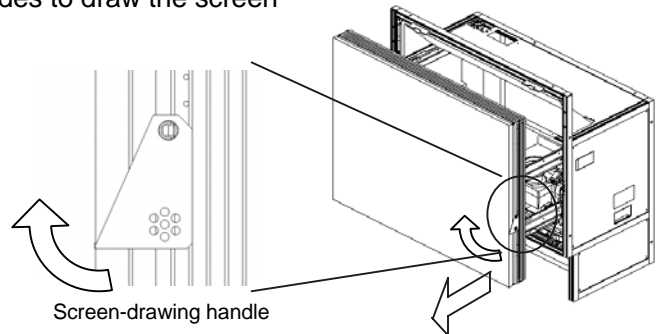
1. **50"**: Remove two screen-fixing bolts (M6 – 45mm, gold hexagon socket).

Caution

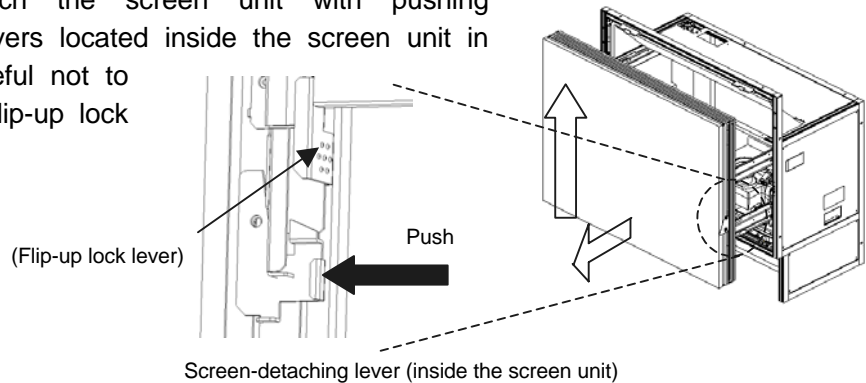
Before shipment, be sure to tighten the bolts (see chapter 2.5.4, on page 86). Shipping the product without tightening may cause breakage.



2. Pull screen-drawing handles in both sides to draw the screen till locked.

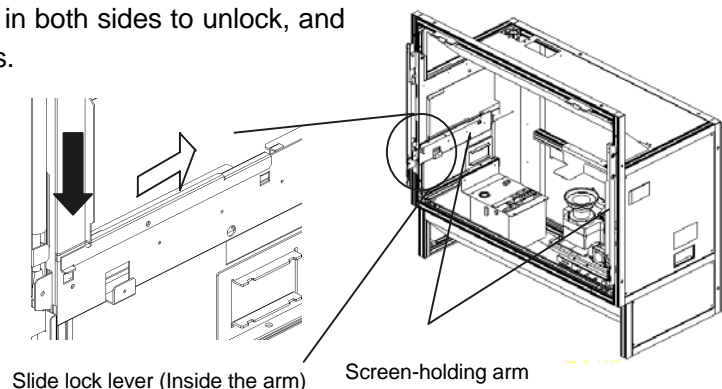


3. Lift up and detach the screen unit with pushing screen-detaching levers located inside the screen unit in both sides. Be careful not to push the adjacent flip-up lock lever.



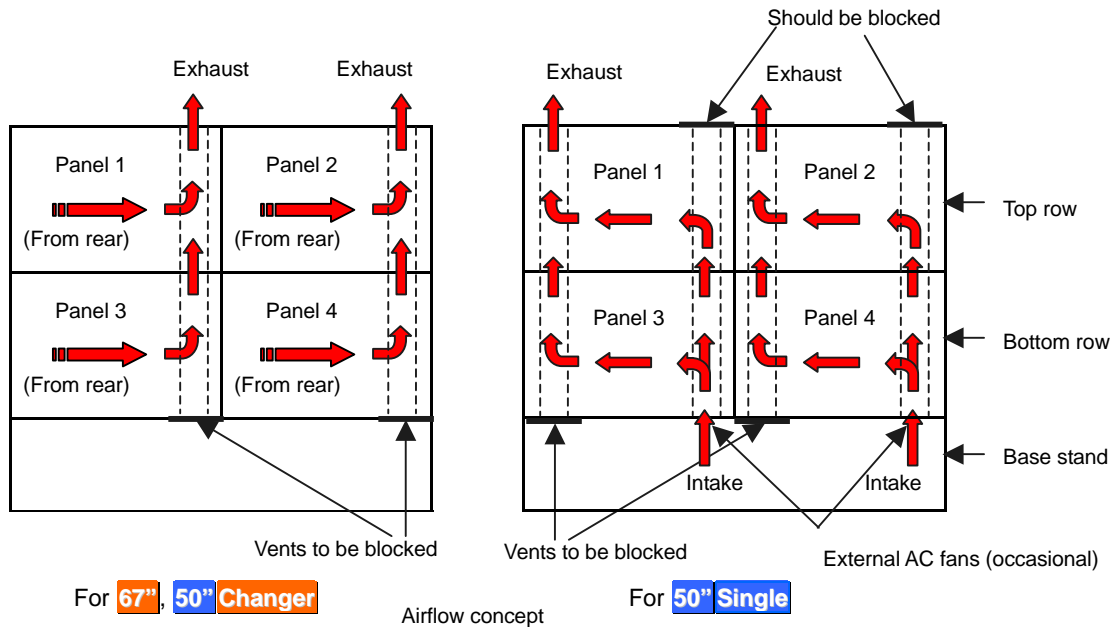
4. Press down the slide lock levers in both sides to unlock, and put back the screen-holding arms.

67": The levers can be unlocked respectively.



1.2.6.3. Ventilation

To ensure a proper airflow for cooling, you need to block some vents as the following figures.

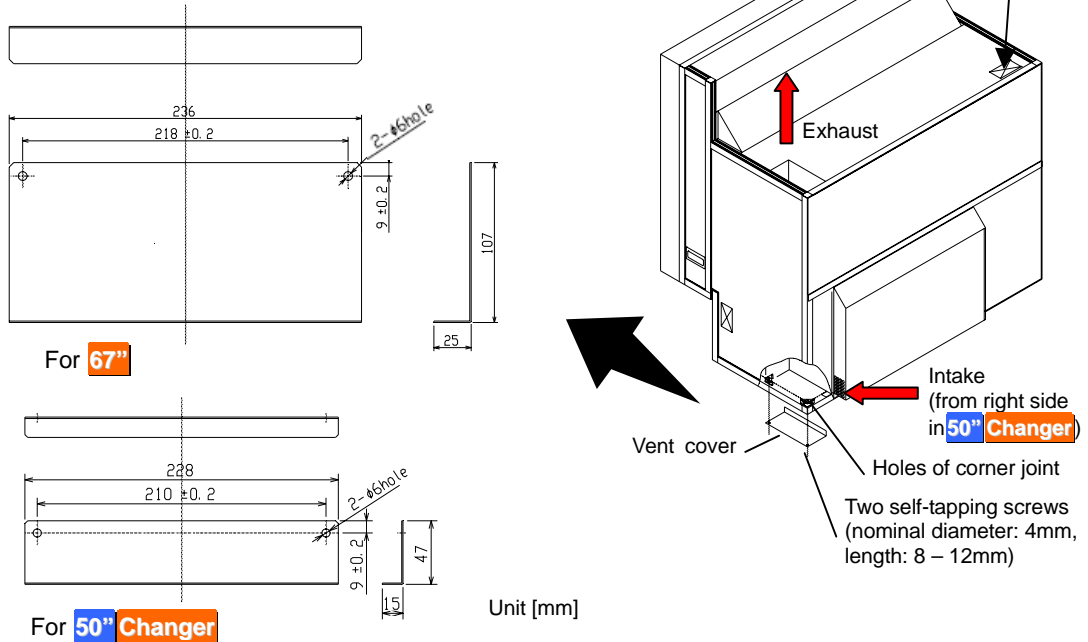


1.2.6.3.1. For **67"**, **50" Changer**

- Block the vents in the bottom row. Prepare a cover material by yourself in reference to the figures below. The covers can be fixed with two self-tapping screws (nominal diameter: 4mm, length: 8 – 12mm) on the holes of the corner joint. Be sure this work is only for the cubes in the bottom row.

Vent covers (example):

Material: aluminum or steel plate (thickness: 1mm)

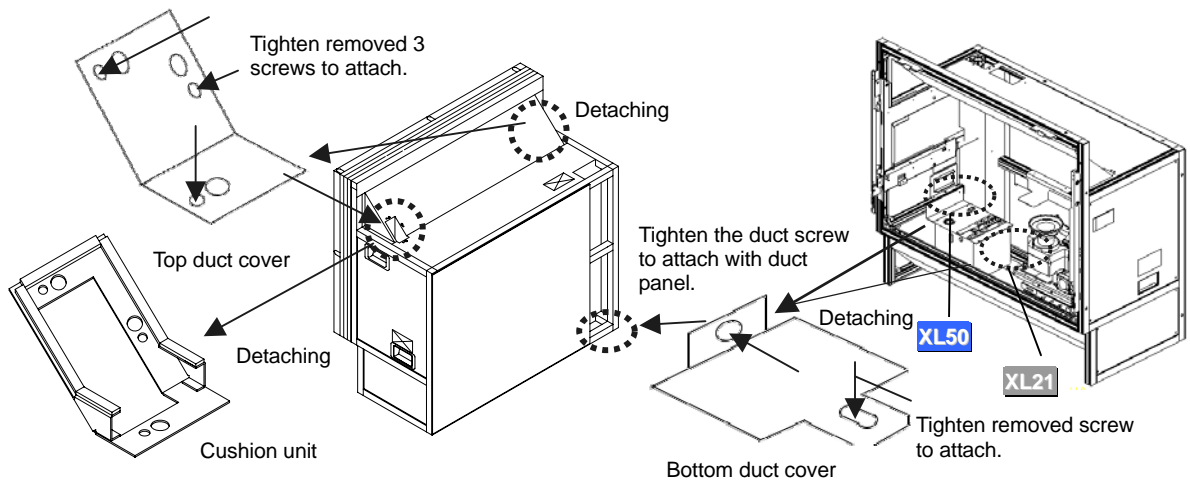


- To keep dust out, seal the cable holes on the top of the display wall. Prepare a cover material by yourself. The size of the holes is 116.5mm x 63mm. Be sure this work is only for the cubes in the top row.

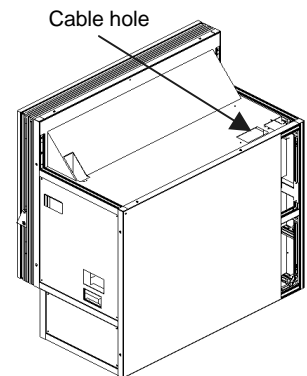
1.2.6.3.2. For **50" Single**

According to circumstances, attach the optional external AC fans (JC-AF115R or JC-AF230R) on the intake vents in the bottom row (see "External AC fan attaching" on page 17).

- Prepare openings on base stands to ventilate.
 - Keep enough base stand height not to inhale a coat of dust on a floor from the intake vents.
1. To block the bottom row, detach the bottom duct cover from inside the cube and attach it on the bottom of the duct. Be sure this work is only for the cubes in the bottom row.
 2. To block the top row, remove the cushion unit on the top at first. Then detach the top duct cover from the top surface of the cube and attach it on the top of the duct. Be sure this work is only for the cubes in the top row.



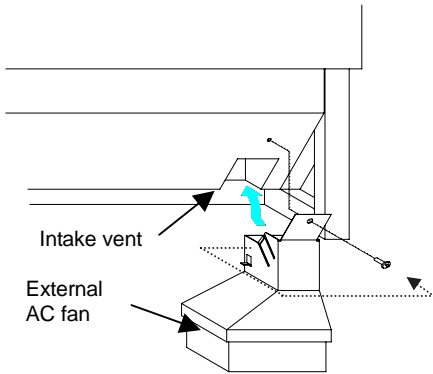
3. To keep dust out, seal the cable holes on the top of the display wall. Prepare a cover material by yourself. The size of the holes is 116.5mm x 63mm. Be sure this work is only for the cubes in the top row.



External AC fan attaching (occasional)

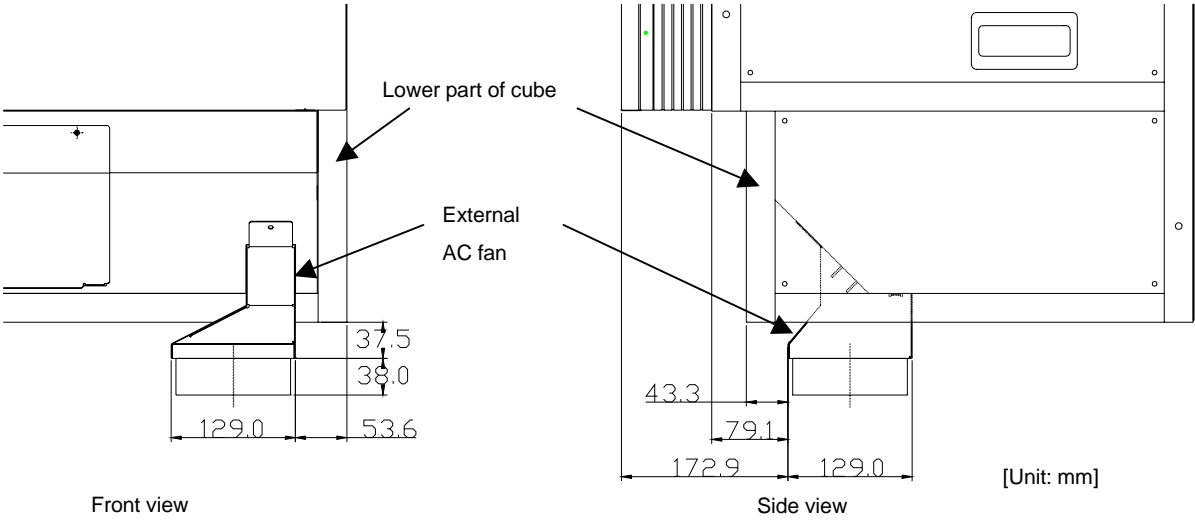
When 4-high configuration with **50" Single**, attach the optional external AC fans (JC-AF115R or JC-AF230R) on intake vents. Even in 3-high configuration, attach the AC fans as well, when spaces are narrower than 50cm to the ceiling and 10cm to the wall behind. Narrow spaces tend to rise the cube internal heat. Be sure this work is only for the cubes in the bottom row.

1. Attach a suitable plug to the bare end of the power cord of the fan to correspond with an interface such as a terminal block or a power strip. 2-meter AC power cord is included in the fan.
2. Insert the fan into the intake vent till click.
3. Fix it to the lower part of cube with the screw supplied with the fan.



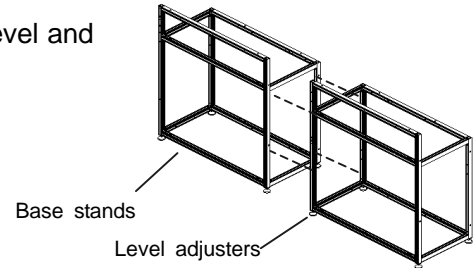
Note:

- To avoid injuries and shock hazards, do not carry electricity to the fan during this work. It must be done by qualified personnel.
- Be sure to use the fan within the range of its power rating.
- The outline of the fan is shown below. Prepare a base stand which does not interfere with the fan.



1.2.6.4. Assembling base stands and cubes

1. Assemble base stands.
2. Adjust level adjusters to make the base stand both level and plumb by means of a spirit level.

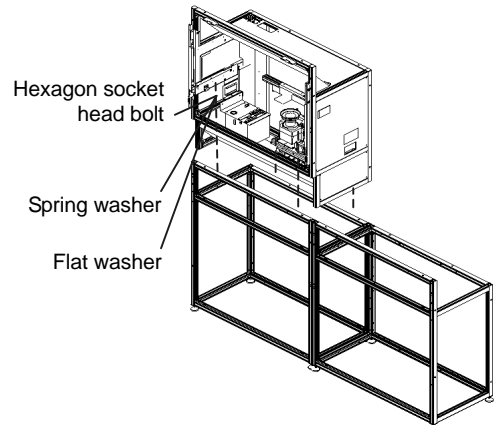


3. Place a cube on the base stand.

Caution

Do not grip the screen-holding arms to lift up a cube cabinet. It may cause breakage.

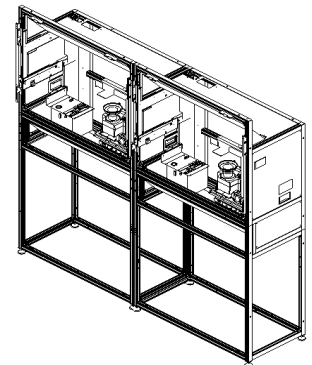
4. Fix the cube at 4 points with supplied hexagon socket head bolts, spring washers and flat washers.



Caution

When holding up a cube, be careful not to put your hand between the cube and the base stand.

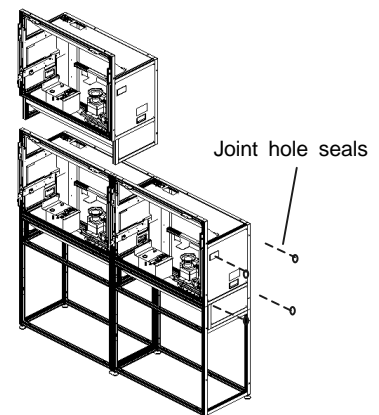
5. Place the next bottom row cube on the base stand and fix it in the same way.
6. Join right and left cubes at 4 points with supplied hexagon socket head bolts, spring washers and flat washers.



7. Place cubes for the upper row on the assembled units.
8. Fix them vertically and horizontally at 4 points each with supplied hexagon socket head bolts, spring washers and flat washers.
9. Stop up the holes on both sides with supplied joint hole seals, which holes are not used for a display wall.

Caution

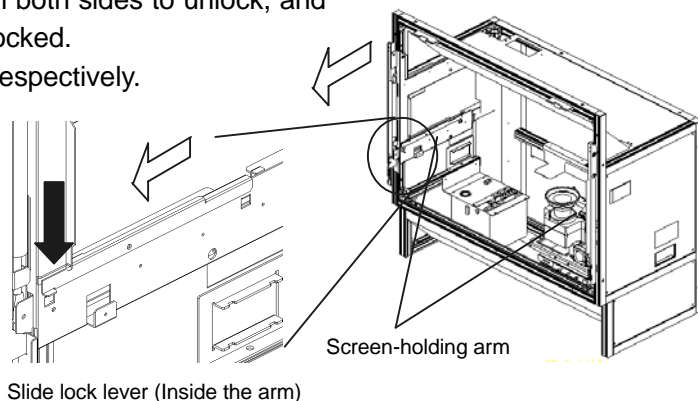
To avoid units from falling, measure horizontal and vertical degrees with a level etc. to make sure the units are stably assembled.



10. Run cables through the internal cabinets according to the chapter 1.3.3 on page 24 before attaching the screen unit.

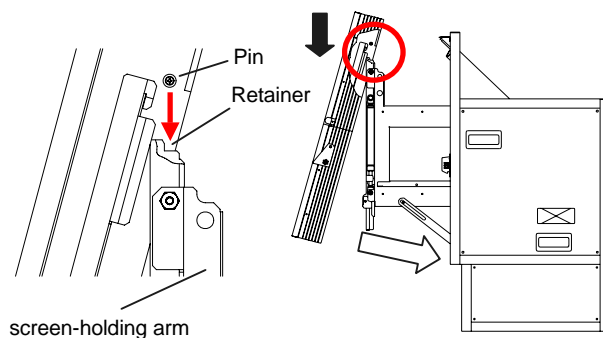
- Press down the slide lock levers in both sides to unlock, and draw the screen-holding arms till locked.

67": The levers can be unlocked respectively.



- Reinstall the screen unit in its original cabinet. Put the pins inside the screen unit on the retainers at the top of the screen-holding arms, following which make the screen upright. Make sure it will be locked securely.

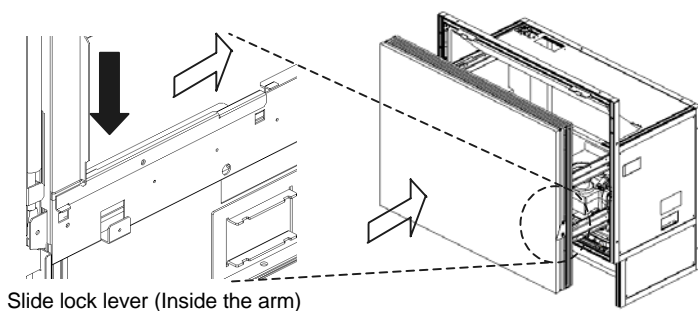
67": Screen attaching/detaching work should be done by two or more people.



- Press down the slide lock levers in both sides to unlock, and push the screen unit along the rail till the end.

67": The levers can be unlocked respectively.

50": You don't have to tighten the removed two screen-fixing bolts.

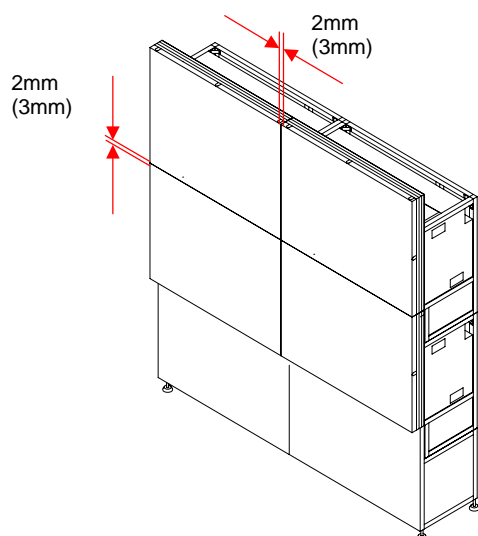


1.2.6.5. Screen gap adjustment

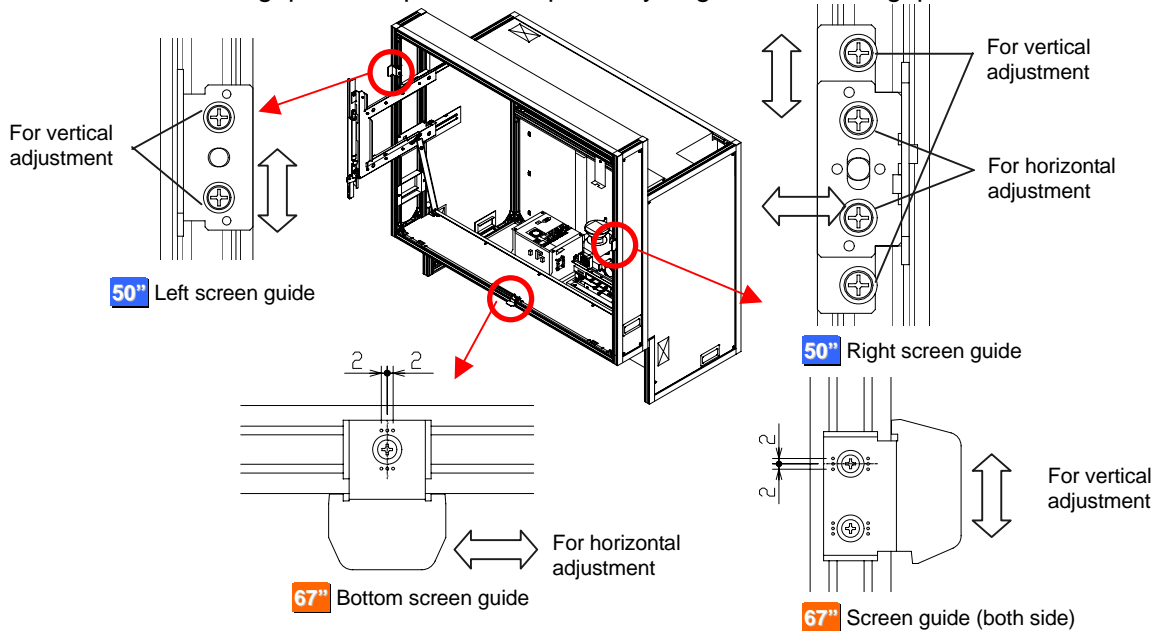
This adjustment is normally unnecessary.

As needed, you can adjust the screen gaps.

- Estimate a distance to move the screens so that the screen gaps will approximately be:
 - 2 mm for **50"** or
 - 3 mm for **67"**.
- Open the screen units (chapter 1.2.7.1, on page 21).

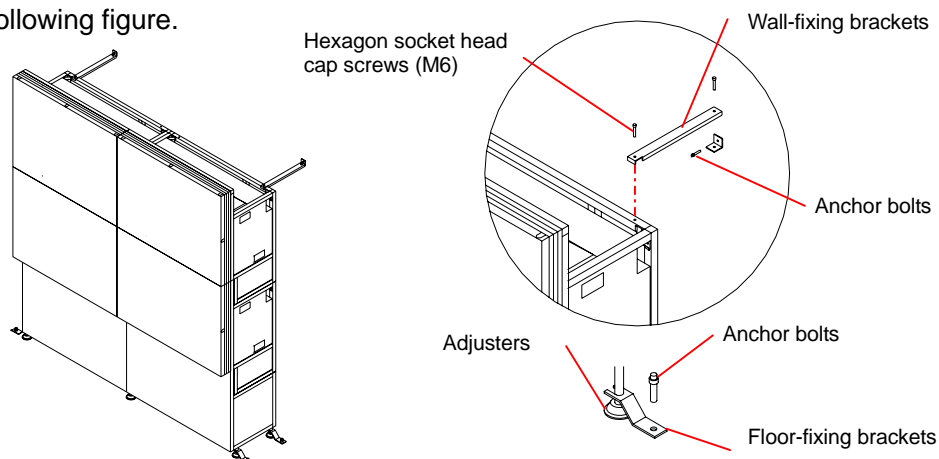


3. For horizontal adjustment: **50"**: Loosen two screws in the right screen guide to adjust its horizontal position and fix them. **67"**: Loosen the screw in the bottom screen guide to adjust its horizontal position and fix it. The screen guide has punch marks at the adjustable range (+/- 2mm) and its center.
4. For vertical adjustment: Loosen two screws each in the left and right screen guides to adjust their vertical positions and fix them. **67"**: The screen guides have the punch marks at the same position as described above.
5. Close the screen units (chapter 1.2.7.2, on page 22).
6. Check the screen gaps and repeat the steps until you get reasonable gaps.



1.2.6.6. Fixing to the wall and floor

1. Attach floor-fixing brackets on 4 level adjusters below the base stand and fix them to the floor with anchor bolts.
2. Fix the upper back part of the display wall to the back wall with wall-fixing brackets as shown in the following figure.



Caution

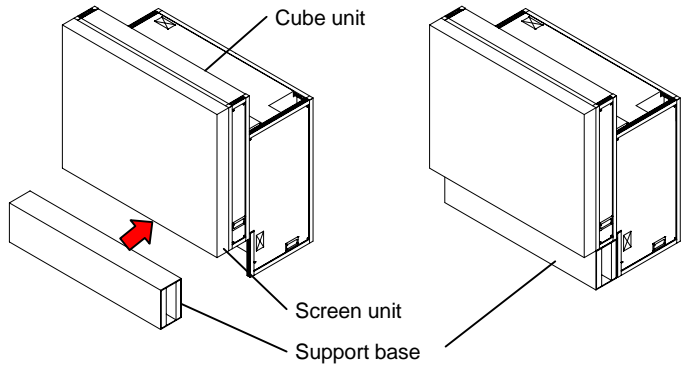
Make sure the whole set is assembled firmly and installed stably. To prevent the set from falling due to unpredictable events such as earthquakes and shocks, fix the set firmly to the wall and floor. Furthermore, carefully confirm the strength of the fixing area of the installation place (wall and floor). The wall and floor fixing method differs according to the number of the assembled units.

1.2.7. Screen open/close (for Front)

Cabling or lamp replacement, etc. requires opening the screen unit. Be careful not to trap your fingers during the work.

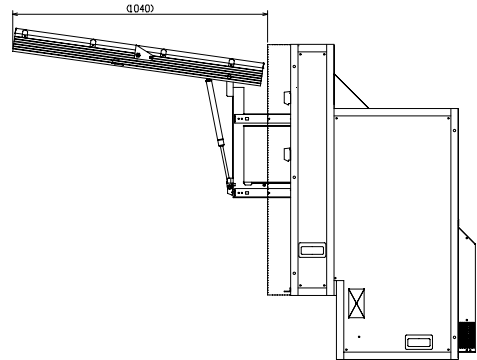
The open/close should be performed on a one-by-one basis in a display wall so as not to shift the center of gravity much.

In particular, **67"** may cause topple down due to wide shifting of the center of gravity. When you open/close the screen units on stand-alone cubes without fixing to a base stand or other cubes, be sure to use the support base which is contained in the cube carton box.

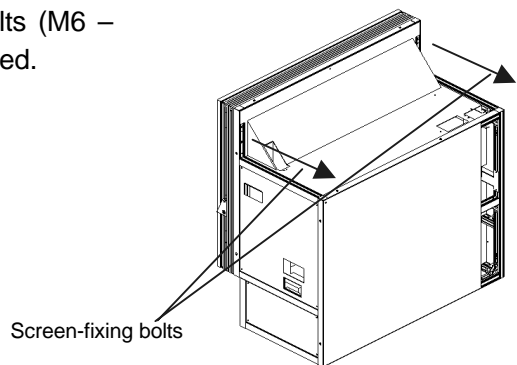


1.2.7.1. Screen opening

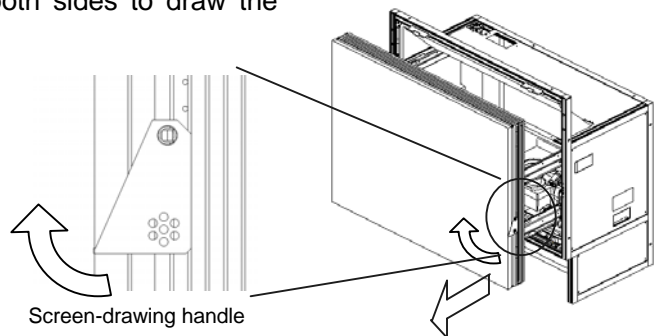
Caution
About one-meter space in front of the screens is needed for the opening. Prior to work, make sure that there is no object such as steps in the working space.



1. **50"**: Make sure that the two screen-fixing bolts (M6 – 45mm, gold hexagon socket) have been removed.



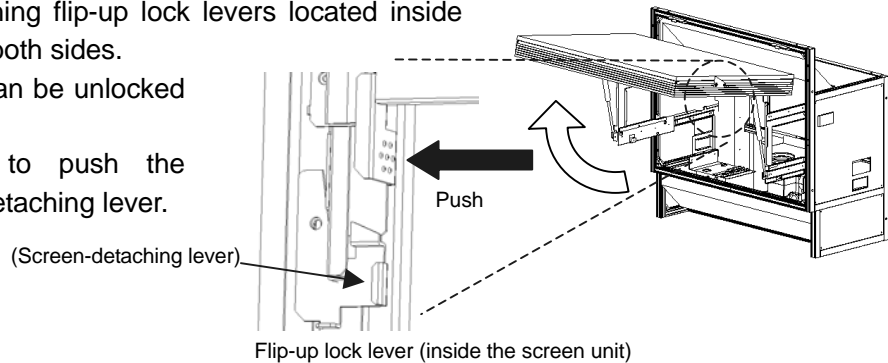
2. Pull the screen-drawing handles in both sides to draw the screen till locked.



3. Pull up the bottom of the screen unit to rotate 90 degrees with pushing flip-up lock levers located inside the screen unit in both sides.

67": The levers can be unlocked respectively.

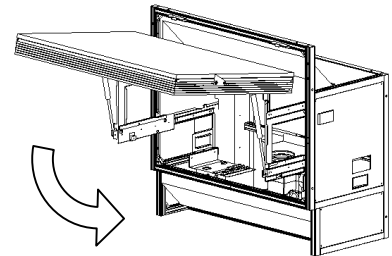
Be careful not to push the adjacent screen-detaching lever.



1.2.7.2. Screen closing

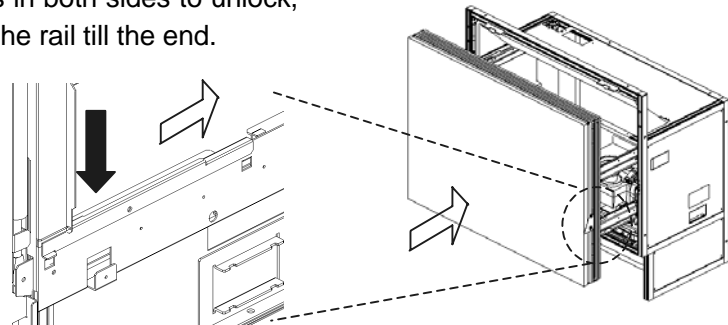
Be careful not to trap your fingers during the work.

1. Push down the bottom of the screen slowly till locked.



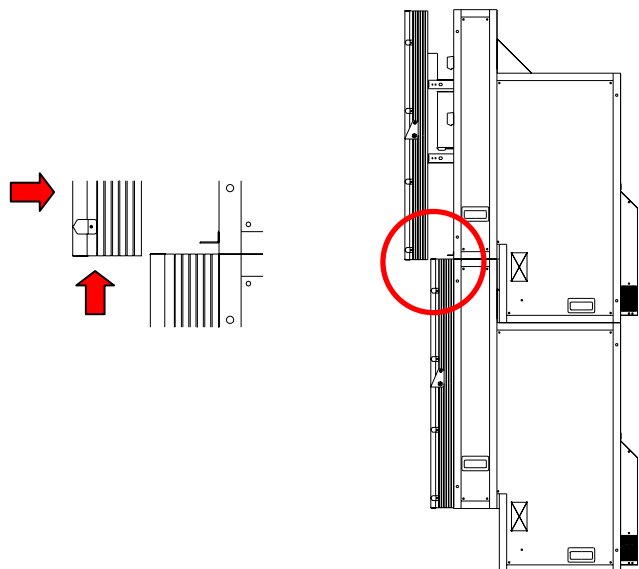
2. Press down the slide lock levers in both sides to unlock, and push the screen unit along the rail till the end.

67": The levers can be unlocked respectively.



Note:

Depending on the screen gap adjustment (chapter 1.2.6.5, on page 19), the screen unit may touch the top edge of the lower screen. In this case, slightly lift the upper screen to close without touching.



1.3. Connecting

1.3.1. Control signal connection

An external controller such as a personal computer etc. can control cubes through RS-232 format communication. In the case of a display wall, connect the external controller to a MASTER cube set by dipswitch (chapter 1.4.2, on page 28) with RS-232 cross cable, and connect CONTROL IN and CONTROL OUT terminals between cubes with supplied control cables. Do not connect to a loop.

Allocating ID numbers by dipswitch, each cube can be controlled separately by one controller. Up to 64 cubes can be chained in one control line.

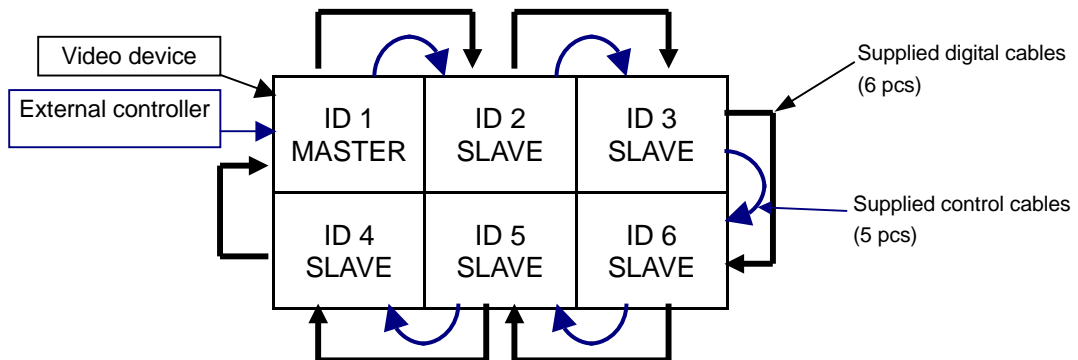
1.3.2. Image signal connection

Connect (an) image input source(s) with cubes adequately.

1.3.2.1. In the case of daisy chain

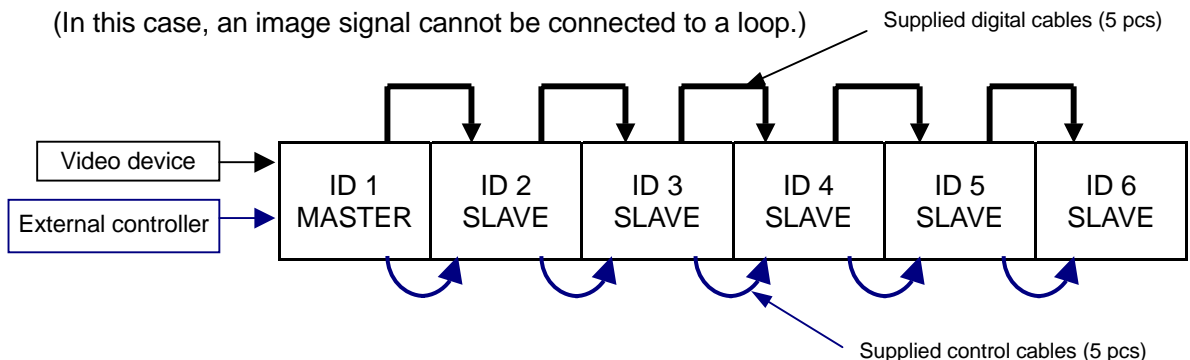
In the case of an enlarged image displaying with digital daisy chain connection, install the optional input boards (chapter 1.2.3, on page 7) and connect DIGITAL IN and DIGITAL OUT terminals between cubes with digital cables (DVI-D) that are supplied with the boards. The digital image signal can be chained up to 16 cubes.

In the case of 3 by 2



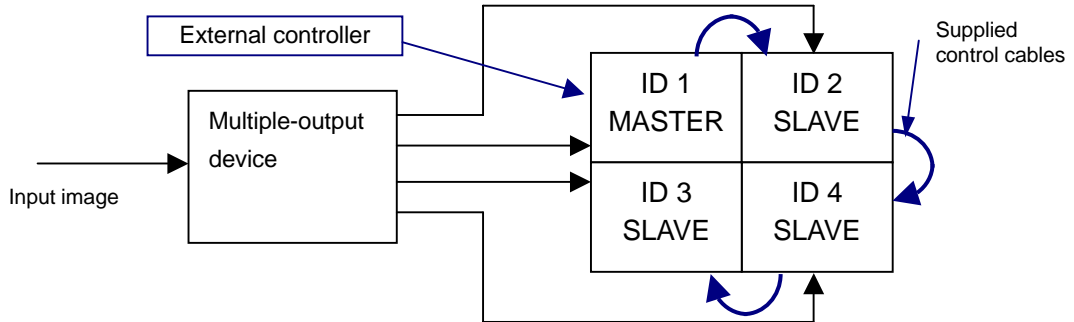
In the case of 6 by 1

(In this case, an image signal cannot be connected to a loop.)



1.3.2.2. For other than daisy chain

Connecting with a multiple-output device, an enlarged image can be displayed as well as daisy chain connection.



Connecting with a multiple-output device (example)

1.3.3. Internal cabling (for **Front**)

Run cables through the holes located on both sides and top/bottom.

For the vertical cabling: Thread the supplied plastic cable ties through the holes in 3 mount bases to fix on the rear surface of the back panel, and fasten the cables with the ties.

For the horizontal cabling:

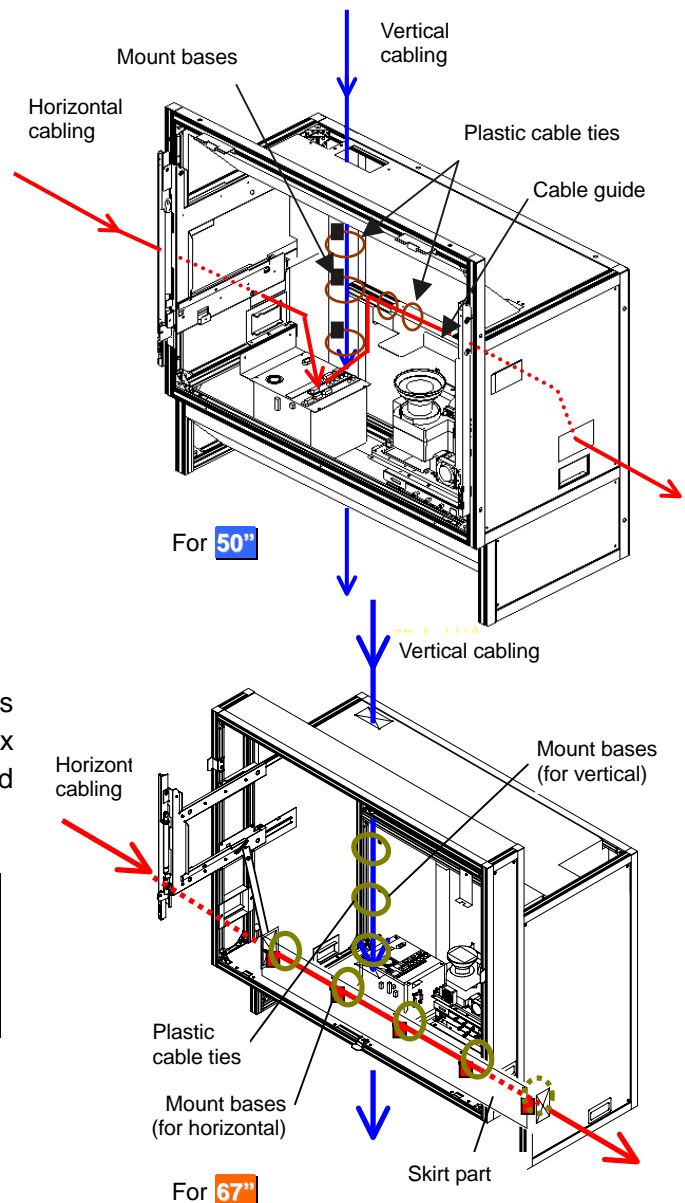
50" Single: Route the cables through the guide below the mirror and fasten them with supplied cable ties as appropriate not to shade picture images from the optical unit.

50" Changer: Run the cables through the cable guide behind the mirror.

67": Thread the supplied cable ties through the holes in 5 mount bases to fix on the rear surface of the skirt part, and fasten the cables with the ties.

Caution

For the safety reason, do not allocate a power strip inside the cube cabinet. It is recommended to use the optional 3-meter power cord.



1.4. Initial set up

1.4.1. Menu operation

1.4.1.1. Control button list

Remote control	In stand-by state	In normal mode		In advanced mode			
		Menu OFF		Menu OFF		Menu ON	
		Test pattern ON	Test pattern OFF	Test pattern ON	Test pattern OFF	Test pattern ON	Test pattern OFF
POWER ON	Turn on	—					
POWER OFF	—	Turn off					
DISPLAY	—	Status information		Status information (Press-and-hold for detail information)			
PIC MUTE	—	—	—	—	Picture mute	—	Picture mute
INPUT A	—	—	Selective input signal list				
MENU1	—	—	Input memory menu		—		
MENU2	—	—	Display memory menu (Press-and-hold for system memory menu)		—		
MEM LIST	—	—	Input memory and display memory list				
R	—	—	R raster on/off	R input on/off	R raster on/off	R input on/off	R input on/off
G	—	—	G raster on/off	G input on/off	G raster on/off	G input on/off	G input on/off
B	—	—	B raster on/off	B input on/off	B raster on/off	B input on/off	B input on/off
TEST	—	—	Test pattern on – pattern rounding – test pattern off				
FUNC	—	—	Remote ID setting mode on/off				
NORMAL	—	Normal mode/advanced mode switching			Initialize		
ESC	—	Cancel, back or test pattern off, etc.					
ENTER	—	—	Define				
UP	—	—	—	—	Menu option and cursor up		
DOWN	—	—	—	—	Menu option and cursor down		
LEFT	—	—	—	—	Value down		
RIGHT	—	—	—	—	Value up		
Number	—	Display memory calling				—	

1.4.1.2. Operation mode

This product has two operation modes: “normal mode” and “advanced mode”. Use the normal mode in usual operation. Switch to the advanced mode when you set up or adjust the product. Two modes can be switched by [NORMAL] button when there is no adjustment menu on screen.

1.4.1.2.1. Normal mode

The normal mode allows you to turn off the power by [POWER] button, to display status information by [DISPLAY] button, to change the operation mode by [NORMAL] button and to call a display memory by number buttons.

Adjustment menus cannot be called in the normal mode.

1.4.1.2.2. Advanced mode

In advanced mode, status information appears on screen as described in right figure.

1. Status display:

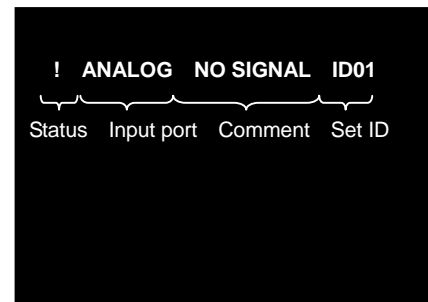
- “!” mark appears when values in a menu are changed. It is also displayed when a value is automatically changed by internal process.
- In **Changer**, “☀” mark appears when the status of a spare lamp is other than “NEW”.
- During lamp position auto calibration (for **Changer**) and initial sensor value obtaining, the operating status is noticed with figures such as “3”, “4” or “7”. When the function has worked correctly, it disappears after 5-minute displaying.

2. Input port: Displaying current input port.

3. Comment:

- “NO SIGNAL” is displayed when any image signal is not input.
- “TEST *” is displayed during internal test patterns displaying.
- “MUTE” is displayed during picture mute.

4. Set ID: Displaying a set ID.



1.4.1.3. Basic menu operation

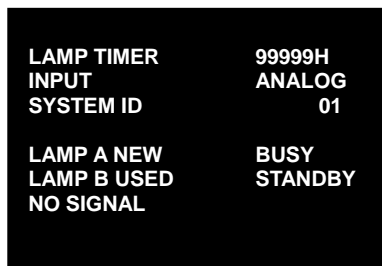
Adjustments should be conducted with the remote control in advanced mode.

(You can also use the adjustment software, “Wallaby” (chapter 4, on page 99)).

- [POWER ON] button: To turn on after main power switch on.
- [MENU1] button: To display the input memory menus.
- [MENU2] button: To display the display memory menus while the input board is attached.
- [MENU2] button (press and hold): To display the system memory menus.
- Up/down button: To select menu items.
- [ENTER] button: To enter each adjusting menu. Some items indicate the lower menu layer.
- Left/right button: To change an adjusting value.
- [ESC] button: To exit menus.
- [NORMAL] button: To reset an adjusting value. In reply to appeared “RESET OK?” message, press [ENTER] button. You can exit the menu without resetting by [ESC] button. [NORMAL] button also executes automatic input signal scanning during input memory menus displaying.
- [FUNC] button: Remote ID setting (chapter 1.4.1.4).
- [TEST] button: To display test patterns (chapter 3.3, on page 91). **Even while any menus are displayed on screen, the test patterns on/off and selecting are available.**
- [R][G][B] buttons: To switch muting/displaying of primary colors. It works regardless of remote ID setting.

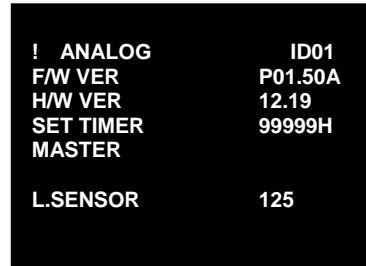
Press-and-hold the button can always display the selected color. This function is helpful when you display the same color across a display wall, which mixes color displaying/muted cubes. Just pressing may unintentionally mute the color in other cubes.

- Number buttons: To call a display memory directly with 3-digit number while there is no menu on screen. For instance, press 001 to call the display memory 1.
- [DISPLAY] button: To show status information.



Status information ([DISPLAY] button)

Lamp operating time
Input port
Set ID
Lamp status
Comment
(In **Changer**)



Detail status information ([DISPLAY] button press-and-hold)

Firmware version
FPGA version
Set operating time
Master/slave setting
Luminous sensor value

1.4.1.4. Remote ID

Remote ID is used to operate remote control toward a specified screen in a display wall. **Even while any menus are displayed on screen, remote ID can be switched.**

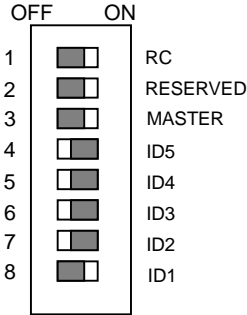
Specify a set ID by [FUNC] button and 2-digit number in advanced mode, which ID has been set in the dipswitch. When you control only ID=1 cube, press [FUNC]+[0]+[1]. It can be also selected by left/right button after the [FUNC] button. And then press [ENTER] button to confirm.

Pressing [FUNC]+[0]+[0] buttons enable remote control toward all cubes.

1.4.2. Dipswitch setting

Before turning on the main power switch, set the dipswitch correctly according to a system configuration (see “1.3 Connecting” on page 23). The set ID can be set up to 64 (see “1.5.1.14 EXTENDED ID” on page 41). Be sure to turn off the main power switch if you change the setting in the middle of the operation. Turning on the main power switch will renew the setting.

No.	Name	Function	Initial setup
1	RC	Enabling remote control (ON: enabled, OFF: disabled)	ON
2	RESERVED	Normally ON.	ON
3	MASTER	MASTER/SLAVE setting (ON: MASTER, OFF: SLAVE)	ON
4	ID5	Designating set ID number (1 to 32) (ON: 1, OFF: 0) ID No.=1×(ID1)+2×(ID2)+4×(ID3)+8×(ID4)+16×(ID5) Example: ID No.=1: ID1=ON, ID2, ID3, ID4 and ID5=OFF ID No.=32 :ID1, 2, 3, 4 and 5=OFF	OFF
5	ID4		OFF
6	ID3		OFF
7	ID2		OFF
8	ID1		ON



1.4.3. Picture outline adjustment

Caution

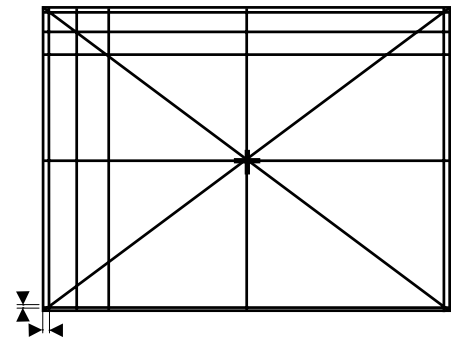
Before turning on, make sure again that the color wheel has been unlocked for **XL21** (chapter 1.2.4.1, on page 8) and, for **XL21 Changer**, the lamp cushion has been removed (chapter 1.2.4.2, on page 9).

1.4.3.1. Displaying internal test pattern

Display the internal crosshatch pattern for picture outline adjustment by pressing [TEST] button twice in advanced mode.

Adjust to align the outermost lines with screen edges.

There are another adjustment lines for over-scan inside the outermost lines. When OVERLAP setting (chapter 1.5.1.6, on page 38) is ON, adjust the picture outline so that these lines fit the screen edges.

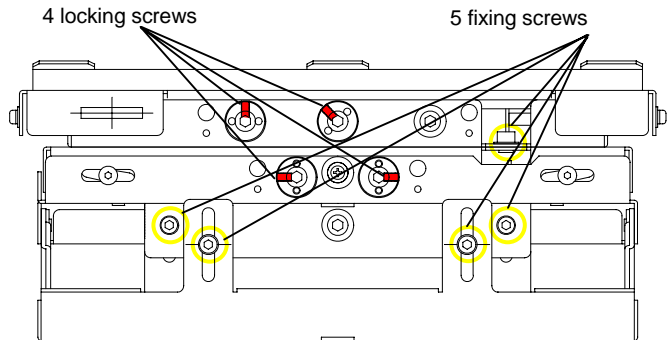


Adjustment lines for over-scan

1.4.3.2. 6-axis adjustment

1.4.3.2.1. Release the lock screws

Before 6-axis adjustment, release locks in the adjuster. Loosen 4 locking screws with an Allen wrench (2mm) and 5 fixing screws with an Allen wrench (4mm).



1.4.3.2.2. When adjusting with motorized adjustment tool, S-AXL50E

Attaching

1. Set the rotary dial in the upper unit of the adjustment tool according to the product (chapter 3.8.4.2, on page 97). The initial setting is 0.

- **Front**: Set it 0.
- **Rear**: Set it 1.

2. Make sure the slide switch is set OPE (right side).

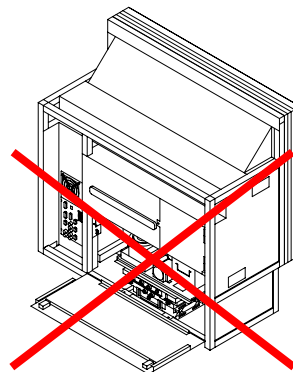
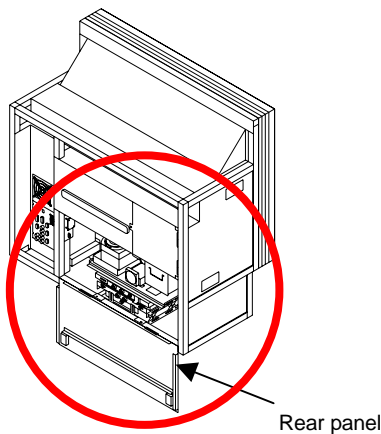
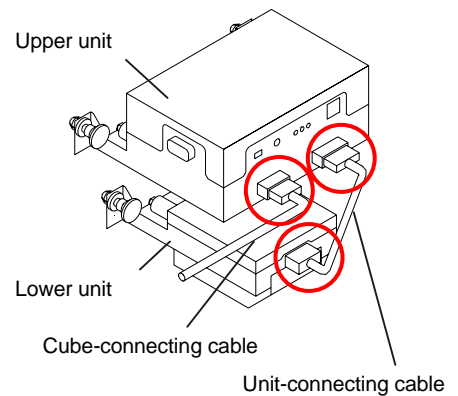
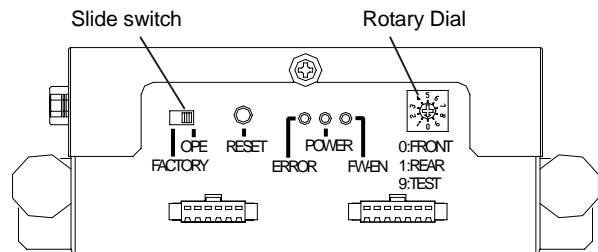
3. Connect the upper and lower units with a supplied unit-connecting cable.

4. Connect a supplied cube-connecting cable with upper unit.

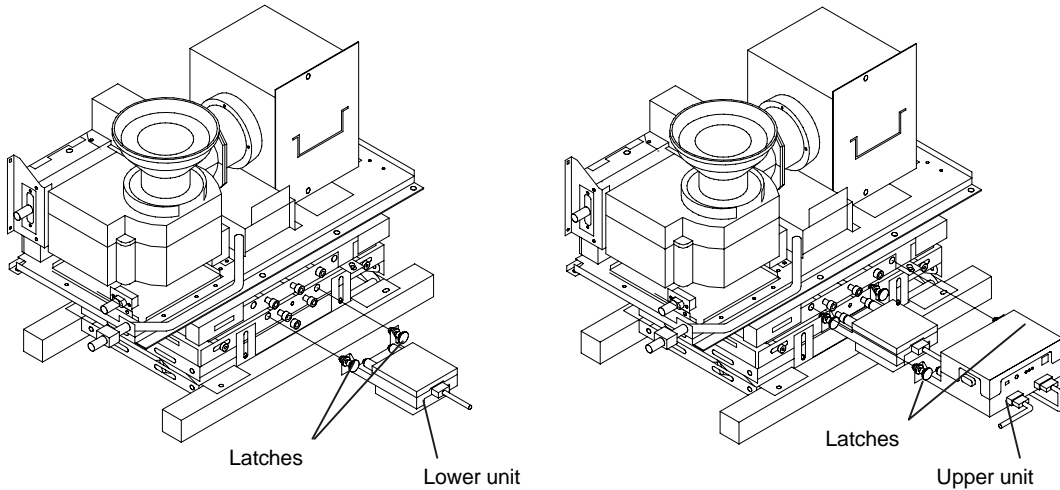
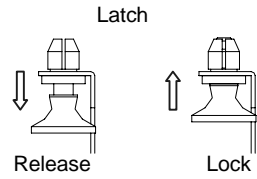
5. Open the screen (chapter 1.2.7.1, on page 21) or rear panel to access the 6-axis adjuster.

Note:

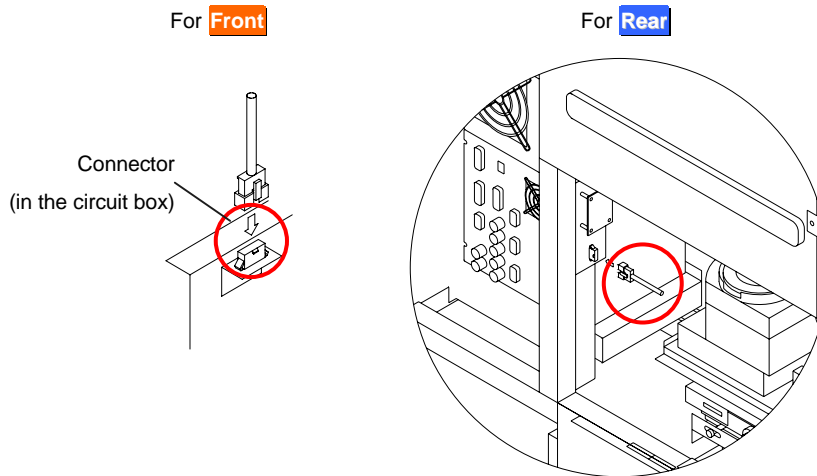
For **Rear**, open the rear panel 180 degrees or remove it to perform the adjustment. Adjustment with half-open panel may cause breakage due to interference with the adjustment tool.



6. Make sure that latches on the units are released before the attaching the units.
7. Attach the units on the adjuster in order of the lower and upper unit.
8. Push the two latches each till click to fix the units.



9. Connect the other end of the cube-connecting cable with a connector inside the cube as following figures. The cable can be connected under operating conditions.



10. **Front**: Close the screen (chapter 1.2.7.2, on page 22).

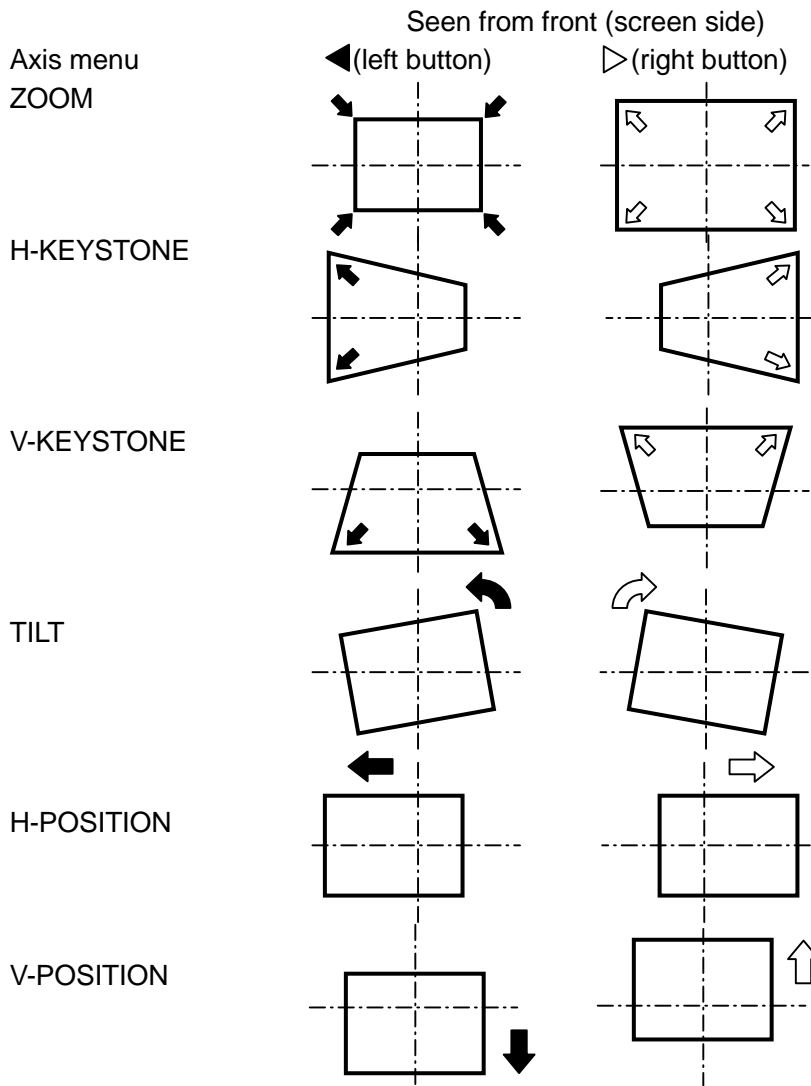
Adjustment

Perform the picture outline adjustment with remote control.

1. Make sure to release the locks in the adjuster (chapter 1.4.3.2.1 on page 29).
2. Display the internal crosshatch pattern for picture outline adjustment by pressing [TEST] button twice in advanced mode. (Refer to the chapter 1.4.1.2 on page 26).
3. Press-and-hold [MENU2] button to display the system memory menu.
4. Select MECH ALIGNMENT in MAINTENANCE in the system menu.
5. Select an axis menu by up/down buttons and adjust it by right/left buttons. The bird icon moves its beak on screen during communication with the remote control. Also arrow mark appears to indicate the direction of button pressing.

Note:

When you reach the end of the adjustment range, \triangle mark appears on screen and the picture outline doesn't move ahead. In this case, turn back and readjust combining with other axes. If you cannot turn the axis due to adjusting tool locking, follow the chapter 3.8.5, on page 98 to recover from the error.

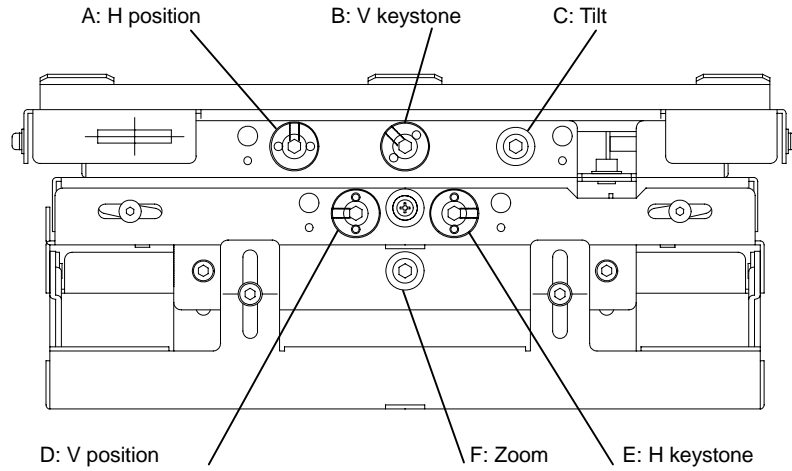


Detaching

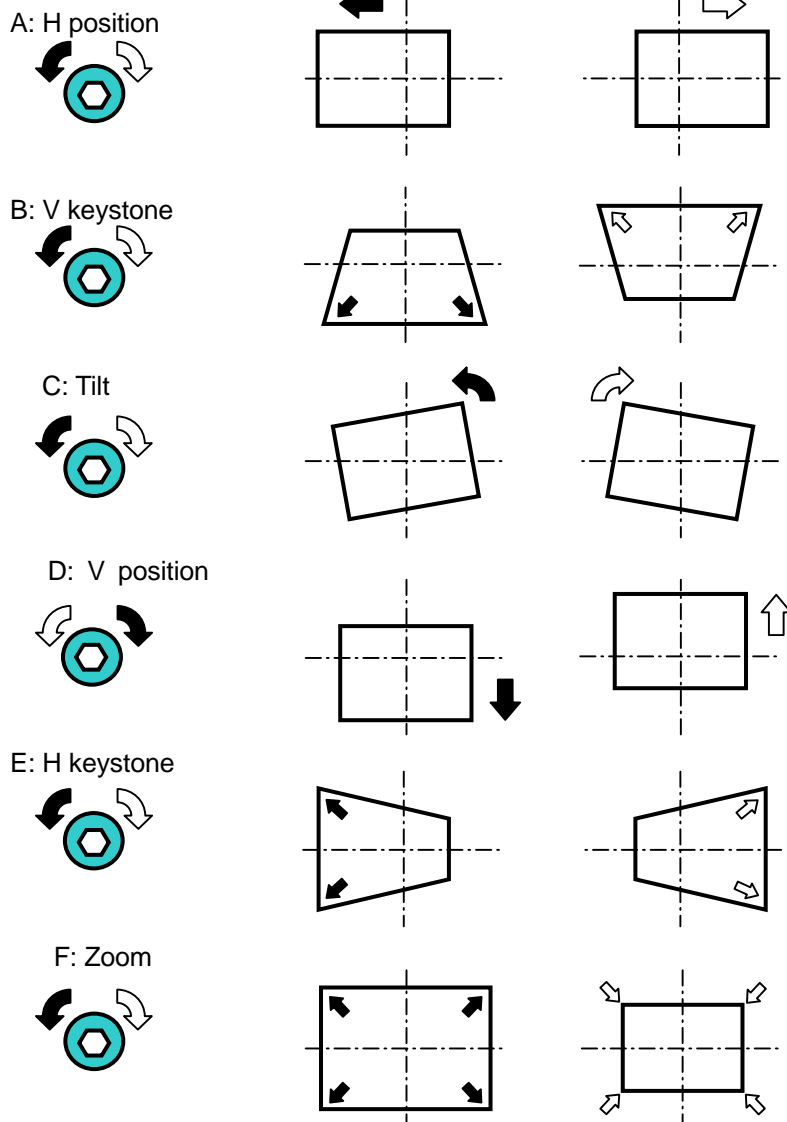
After the adjustment, pull the latches to release the locks and detach the units in the reverse order of attaching. Be careful not to load an excessive force to the adjuster.

1.4.3.2.3. When adjusting by manual

Perform the picture outline adjustment with an Allen wrench (5mm).

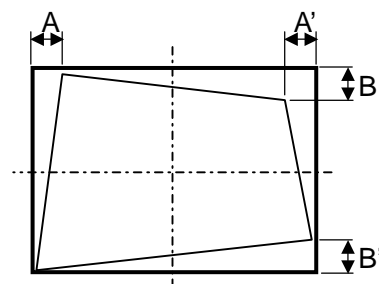


Seen from front (screen side)

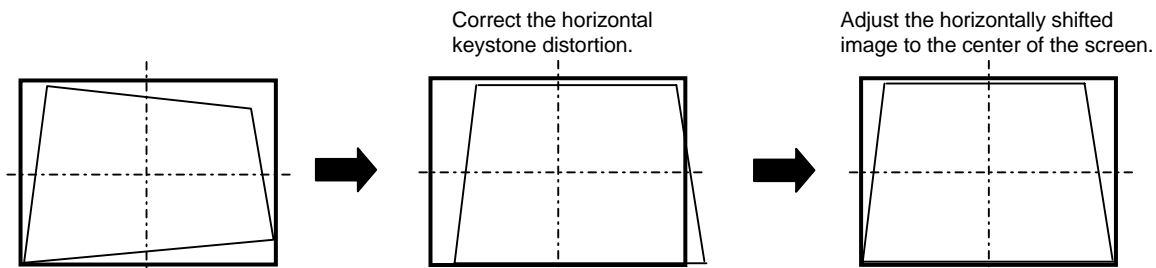


1.4.3.2.4. Adjusting procedure

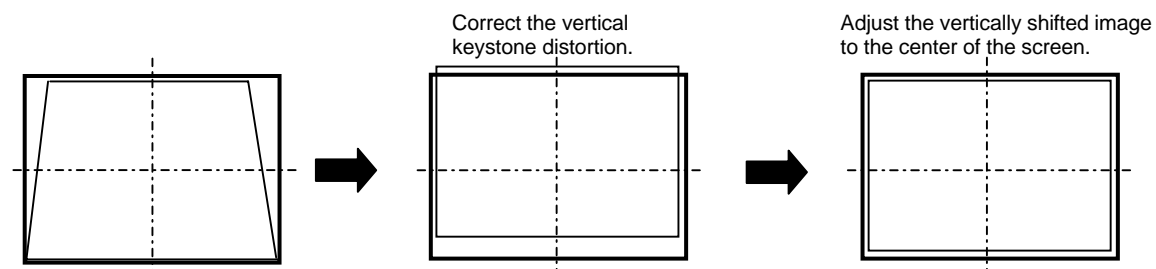
1. After making an image size smaller than the outline of screen with the zoom axis, adjust Tilt, V position and H position so that upper and lower spaces and right and left spaces will be almost equalized respectively.
 $A=A'$, $B=B'$



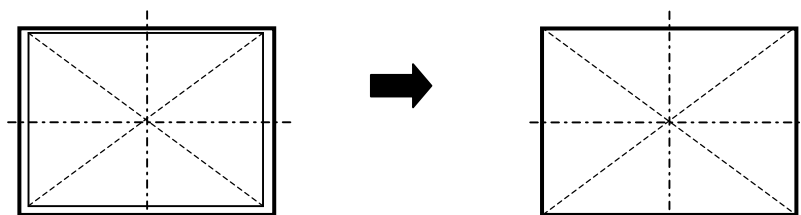
2. Correct the horizontal keystone distortion, and adjust the image position to the center of the screen with "H position".



3. Correct the vertical keystone distortion, and adjust the image position to the center of the screen with "V position".



4. Adjust the image size to fit the outline of the screen.



5. Adjust all screens roughly, and tweak so that each image will link seamlessly in a multi screen.

1.4.3.2.5. Fixing the adjuster

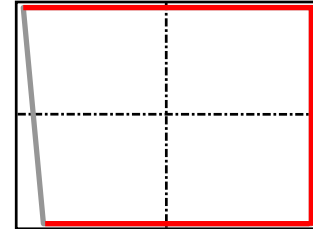
Fix the 5 fixing screws in the reverse order of "1.4.3.2.1 Release the lock screws" on page 29. Before shipment, in addition to above, be sure to fix the 4 lock screws of the adjuster (chapter 2.5, on page 85).

1.4.3.3. Mirror adjustment

1.4.3.3.1. Parallelogram distortion correction

When a parallelogram distortion cannot be corrected with the 6-axis adjuster, correct it according to the following procedure.

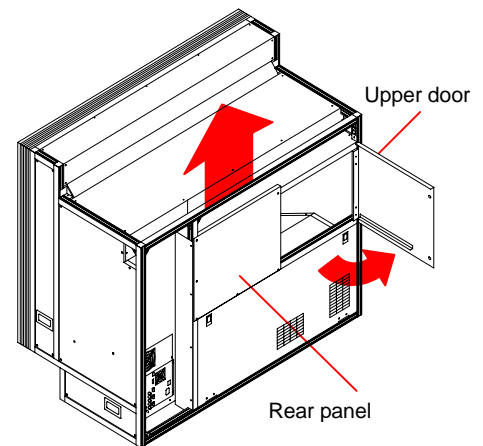
1. Align top, bottom and right lines of the crosshatch pattern with the screen edge by the 6-axis adjustment.



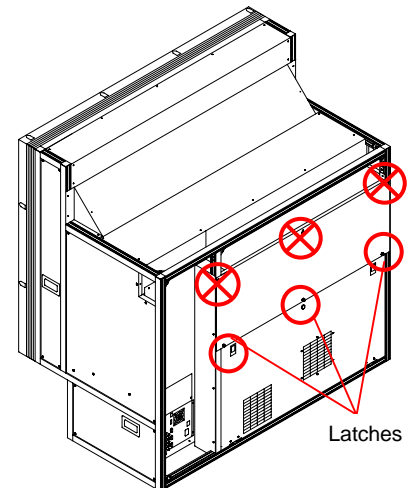
Parallelogram distortion

2. **Rear**: Loosen screws in the rear panel and upper door. And then open the upper door and lift the rear panel to remove.

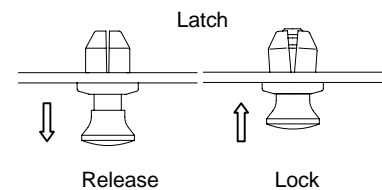
Front: Open the screen unit (chapter 1.2.7.1, on page 21).



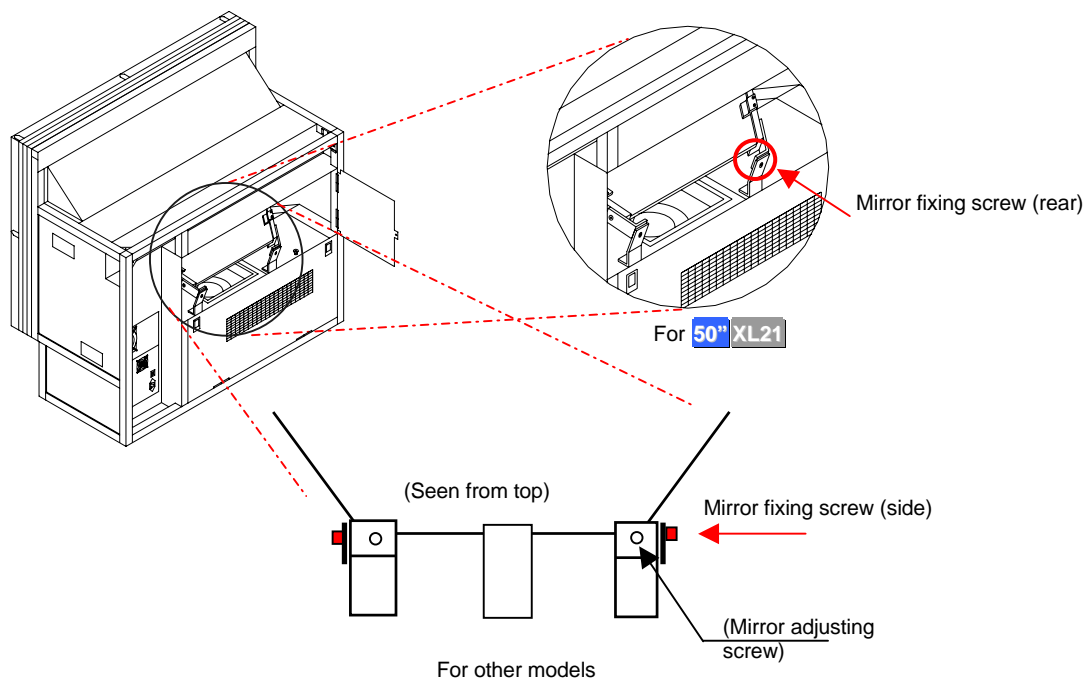
PH50 Rear: Pull 3 latches on the bottom edge of the rear panel to release. It is no necessary to loosen 3 screws on the top edge. Lift the panel to remove.



Note: Make sure that the latches are released before reattaching the panel. The panel cannot be attached with latches locked. For reattaching, attach the panel and push the latches till click to lock.



- Loosen a mirror fixing screw located in the right seen from the rear. (Or in the left seen from the front in **Front**.)



- Turn the mirror adjusting screw.

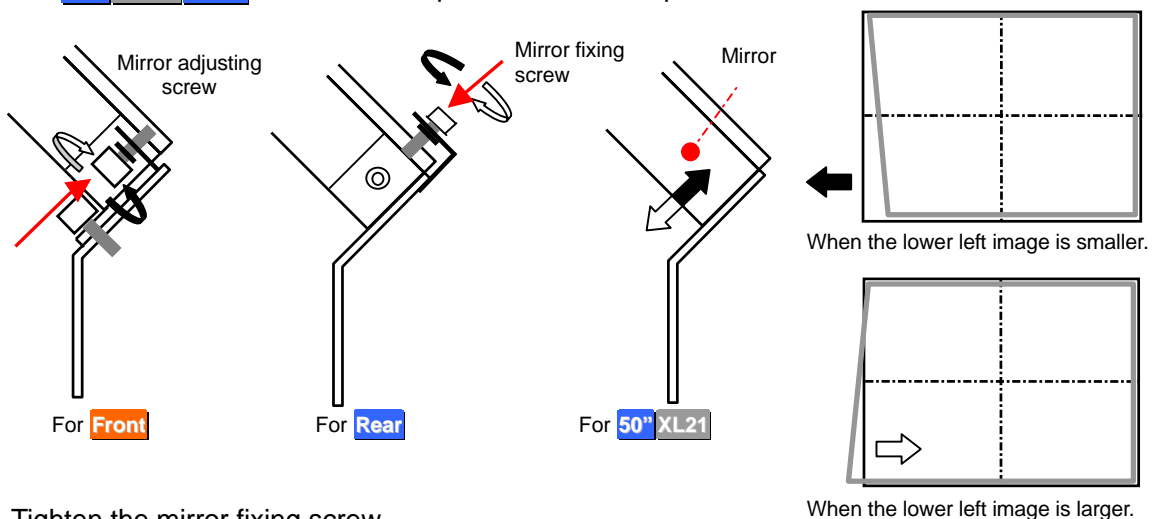
For **Front**:

- When the lower left image is smaller: turn the screw anti-clockwise
- When the lower left image is larger: Turn the screw clockwise

For **Rear**:

- When the lower left image is smaller: Turn the screw clockwise
- When the lower left image is larger: Turn the screw anti-clockwise

For **50\"/>**



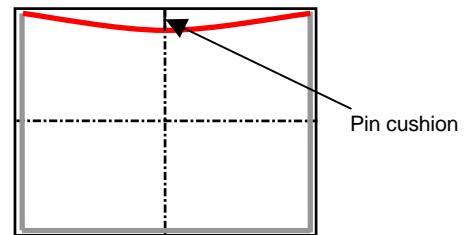
- Tighten the mirror fixing screw.
- After the correcting, tweak the picture outline with 6-axis adjuster.

1.4.3.3.2. Pincushion distortion correction (for 50")

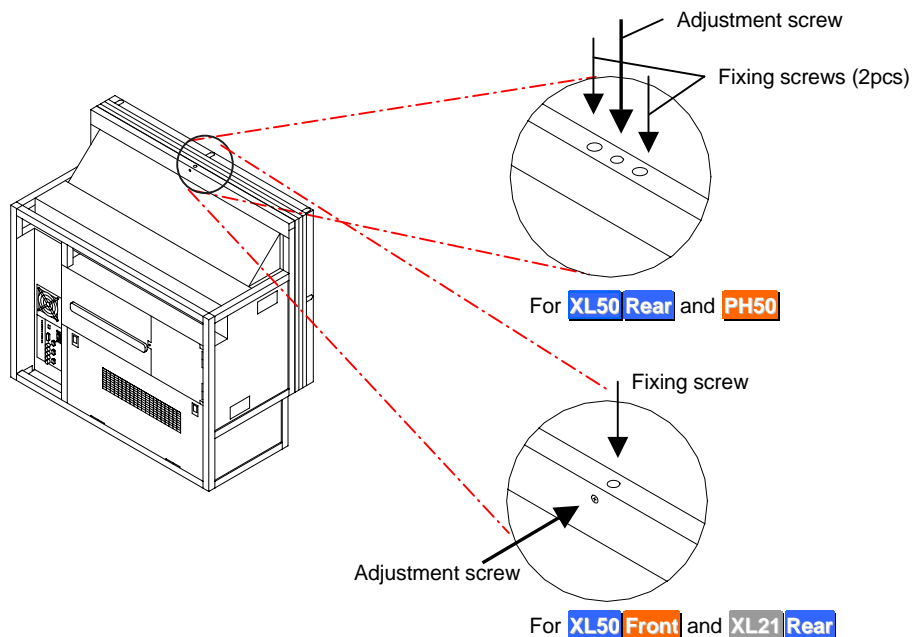
When pincushion distortion appears and it cannot be corrected with 6-axis adjuster, you can correct it according to the following procedure.

Even after cube stacking, you can reach the following screws for the correction through holes in the upper cube. Detach a screen from the upper cube to access the screws.

Note: In **XL21 Rear**, this correction should be done before cube stacking. You cannot access the adjusting screws after the stacking.



1. Align the top corners of the crosshatch pattern with the screen corners by the 6-axis adjustment.
2. Loosen fixing screw(s) and turn the adjustment screw to correct the distortion.



3. After the adjustment, tighten the fixing screw(s).
4. After the adjustment, fix the 6-axis adjuster (chapter 1.4.3.2.5, on page 33).

1.5. System memory setting

Set the system memory as shown below to suit a configuration. The parameters are effective for all input memories and display memories.

Press and hold [MENU2] button to display the system memory menus. You can exit the menu by [ESC] button.

1.5.1. System set up

1.5.1.1. LAMP POWER

Used to set brightness mode. The initial setting is NORMAL.

BRIGHT mode can make cubes brighter. The lamp life becomes shorter than NORMAL mode.

[Procedure]

1. Select LAMP POWER in MISC FUNCTION in the system menu.
2. Set NORMAL or BRIGHT.

1.5.1.2. LAMP MODE (for XL21)

This adjustment is normally unnecessary.

Used to set lamp-driving system. The initial setting is F-REDUCTION.

- F-REDUCTION: It drives with lamp flicker reduction.
- LONG LIFE: It drives with longer lamp life than F-REDUCTION mode even though the flickers may occur.
- NORMAL: it automatically change F-REDUCTION and LONG LIFE mode.

[Procedure]

1. Select LAMP MODE in MISC FUNCTION in the system menu.
2. Set F-REDUCTION, LONG LIFE or NORMAL.

1.5.1.3. TERMINATE

This adjustment is normally unnecessary.

Used to select the termination of analog synchronizing signal in the main input. The initial setting is 1K (1K Ω termination). If the synchronization is lost while 5-line (separate sync) analog input in the main input, set this item to 75 (75 Ω termination). The image may be displayed correctly.

[Procedure]

1. Select TERMINATE in MISC FUNCTION in the system menu.
2. Set 75 or 1K.

1.5.1.4. S.TERMINATE (for the input board)

This adjustment is normally unnecessary.

Used to select the termination of analog synchronizing signal in the input board. The initial setting is 1K (1K Ω termination). If the synchronization is lost while 5-line (separate sync) analog input in the input board, set this item to 75 (75 Ω termination). The image may be displayed correctly.

[Procedure]

1. Select S.TERMINATE in MISC FUNCTION in the system menu.
2. Set 75 or 1K.

1.5.1.5. START MEMORY

This adjustment is normally unnecessary.

Used to designate a display memory number that is loaded at start-up. The initial setting is OFF. To display a designated image source, set a registered display memory number (chapter 1.8.7, on page 68), or a registered input memory number when the main input port is selected. If it is set OFF, the product starts up with a last loaded memory.

[Procedure]

1. Select START MEMORY in MISC FUNCTION in the system menu.
2. Set 1 – 256 or OFF.

1.5.1.6. OVERLAP (for the input board)

This adjustment is normally unnecessary.

Used to set the overlap mode that can automatically calculate the output size so as to fit the screen size in consideration of an over scan area. The initial setting is OFF.

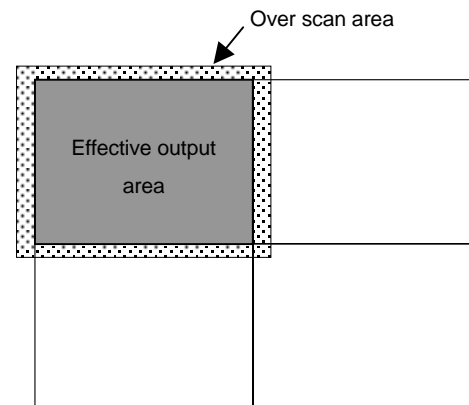
ON setting creates the over scan area. Even if a displayed image unexpectedly shifts in a daisy-chained display wall, a black pixel-lacking area in fringe of a screen would be hard to see.

For this mode, adjust the picture outline so that the lines for over-scan fit the screen edges in advance (chapter 1.4.3.1, on page 28).

In the case of an enlarged image displaying with a multiple-output device or a single screen, this mode may make small characters blurred. Normally set OFF.

[Procedure]

1. Select OVERLAP in MISC FUNCTION in the system menu.
2. Set ON or OFF.



1.5.1.7. OFFSET (for the input board)

This adjustment is normally unnecessary.

Used to tweak horizontal/vertical positions and size if the picture outline is shifted after the final 6-axis adjustment.

[Procedure]

1. Select OFFSET in MISC FUNCTION in the system menu.
2. H.POSITION: to adjust horizontal position.
3. V.POSITION: to adjust vertical position.
4. H.SIZE: to adjust horizontal size.
5. V.SIZE: to adjust vertical size.

1.5.1.8. BAUD RATE

Used to select the transmission speed of RS-232 in accordance with an external controller setting. The initial setting is 19200 (19,200bps). You can select 9,600bps or 19,200bps.

[Procedure]

1. Select BAUD RATE in MISC FUNCTION in the system menu.
2. Set 9600 or 19200.

1.5.1.9. SYSTEM SYNC

Used to set a vertical synchronizing frequency in accordance with a moving pictures signal to be mainly displayed. The initial setting is 60 (60Hz). Set 60Hz for NTSC signal or 50Hz for PAL signal. All cubes in a display wall should be the same setting.

[Procedure]

1. Select SYSTEM SYNC in MISC FUNCTION in the system menu.
2. Set 60 or 50.

1.5.1.10. IMAGE FLIP

This adjustment is normally unnecessary.

Used to invert the displayed image vertically or horizontally. **Rear** should be set S/W for the normal image.

- S/W: Normal image
- S/E: Vertically flipped image
- N/W: Horizontally flipped image
- N/E: Vertically/horizontally flipped image

[Procedure]

1. Select IMAGE FLIP in MISC FUNCTION in the system menu.
2. Set S/W, S/E, N/W or N/E.

1.5.1.11. INDICATION

This adjustment is normally unnecessary.

Used to set how to indicate the status information.

1.5.1.11.1. WARNING (for **Changer**)

This is to set the indication of a warning mark on screen to induce to replace the spare lamp after auto-lamp changing or pre-announcement of the changing (“2.1.3.5 Warning indication”, on page 80).

- OFF: No indication.
- MESSAGE, ☀: To display both pre-announcement of auto-lamp changing and a warning mark to induce to replace the spare lamp.
- ☀: To display only the warning mark.

[Procedure]

1. Select WARNING in INDICATION in MISC FUNCTION in the system menu.
2. Set OFF, MESSAGE ☀ or ☀.

1.5.1.11.2. STANDBY

This is to set a blue LED indication on screen (“3.5 LED display”, on page 91) at stand-by state.

- LED: To light the blue LED on screen.
- OFF: No indication.

[Procedure]

1. Select STANDBY in INDICATION in MISC FUNCTION in the system menu.
2. Set LED or OFF.

1.5.1.11.3. ERROR

This is to set a blue LED indication on screen (“3.5 LED display”, on page 91) at shutdown due to errors.

- LED: To blink the blue LED on screen.
- OFF: No indication.

[Procedure]

1. Select ERROR in INDICATION in MISC FUNCTION in the system menu.
2. Set LED or OFF.

1.5.1.11.4. BLOWOUT (for **XL21** or when the input board is selected in **PH50** and **XL50**)

This is to set a blue LED indication on screen (“3.5 LED display”, on page 91) at lamp blowout when BLOWOUT (chapter 1.5.1.13, on page 41) is set OPERATE.

- LED: To blink the blue LED on screen.
- OFF: No indication.

[Procedure]

1. Select BLOWOUT in INDICATION in MISC FUNCTION in the system menu.
2. Set LED or OFF.

1.5.1.12. AUTO POWER ON

Used to set automatic turning on when the main power is supplied. The initial setting is OFF.

- ON: Automatic turning on when the main power is supplied.
- OFF: When the main power is supplied, the product takes over the last memory status. For instance, it becomes stand-by state if the main power was turned off in stand-by state. Likewise, if it was turned off in the state of power on, it automatically turns on.

[Procedure]

1. Select AUTO POWER ON in MISC FUNCTION in the system menu.
2. Set ON or OFF.

1.5.1.13. BLOWOUT (for **XL21 or when the input board is attached in **PH50** and **XL50**)**

This adjustment is normally unnecessary.

Used to select digital output status after lamp blowout. The initial setting is OPERATE.

- OPERATE: After lamp blowout, it maintains the digital output function. Set OPERATE when the digital out is used for the digital daisy chain connection.
- SHUTDOWN: After lamp blowout, the product starts shutdown. Set SHUTDOWN for a single screen or a display wall without digital daisy chain connections.

[Procedure]

1. Select BLOWOUT in MISC FUNCTION in the system menu.
2. Set OPERATE or SHUTDOWN.

1.5.1.14. EXTENDED ID

Used to set the ID number 33 or higher. The initial setting is NORMAL.

- NORMAL : The set ID can be set 1 to 32 by dipswitch (chapter 1.4.2, on page 28).
- ID:33–64 : The set ID can be set 33 to 64. When the ID is set 1 by the dipswitch, it is automatically recognized as 33 in this mode.

[Procedure]

1. Select EXTENDED ID in MISC FUNCTION in the system menu.
2. Set NORMAL or ID:33–64.

1.5.1.15. CABLE LENGTH (for **PH50** and **XL50**)

Used to set it according to a digital cable length of image inputs. The initial setting is NORMAL. Set LONG when image noise is noticeable due to a transmission attenuation through a long digital cable such as over 5 meters. As needed, CUSTOM menu can be selected for more detailed adjustment.

[Procedure]

1. Select CABLE LENGTH in MISC FUNCTION in the system menu.
2. Select DIGITAL or S.DIGITAL according to the input port.
3. Set NORMAL, LONG or CUSTOM.
4. When selecting the CUSTOM menu, adjust the LEVEL value so that the noise on images will be minimized. The adjusting range is 0 – 15. The initial value is 13.

1.5.1.16. RESOLUTION (for **PH50**)

This adjustment is normally unnecessary.

Used to switch SXGA and SXGA+ resolution. The initial setting is SXGA+.

- SXGA: SXGA resolution image (1280 x 1024 pixels) is displayed with black outer margins on SXGA+ screen.
- SXGA+: SXGA+ resolution image (1400 x 1050 pixels) is displayed.

[Procedure]

1. Select RESOLUTION in MISC FUNCTION in the system menu.
2. Set SXGA or SXGA+.

1.5.1.17. DIRECTION

This adjustment is normally unnecessary.

Used to set when you substitute an optical unit of **Rear** for **Front** and vice versa.

- REAR: Select for **Rear**.
- FRONT: Select for **Front**. FILTER RESET and FILTER TIME menus (on page 84) will be active in the system menu. The filter time is counted up even during REAR mode. Reset the filter time (chapter 2.4.3.3, on page 84) when switch to FRONT.

[Procedure]

1. Select DIRECTION in INSTALLATION in the system menu.
2. Set REAR or FRONT.

1.5.1.18. LAMP CHANGE (for **Changer**)

1.5.1.18.1. CALIBRATION

This adjustment is normally unnecessary. It is automatically set at auto-lamp changing (chapter 2.1.3, on page 78).

It adjusts the lamp position optimally to maximize the brightness.

[Procedure]

1. Select CALIBRATION in LAMP CHANGER in MAINTENANCE in the system menu.
2. Press [ENTER] button in reply to "SET OK?" message to adjust the lamp to the suitable position automatically.

1.5.1.18.2. CHANGE MODE

This adjustment is normally unnecessary.

Used to set auto-lamp changing due to brightness deterioration (chapter 2.1.3.2, on page 78).

The initial setting is NORMAL.

- OFF: It does not perform the auto-lamp changing due to brightness deterioration.
- NORMAL: The auto-lamp changing starts when the brightness becomes 50% of the initial value.
- LONG: The auto-lamp changing starts when the brightness becomes 30% of the initial value.

[Procedure]

1. Select CHANGE MODE in LAMP CHANGER in MAINTENANCE in the system menu.
2. Set OFF, NORMAL or LONG.

1.5.1.18.3. HOT EXCHANGE

Used to allow spare lamp replacement during the main lamp lighting. The initial setting is FORBID.

- FORBID: The product automatically shuts down when you open the lamp cover.
- ALLOW: You can open the lamp cover during the main lamp lighting.

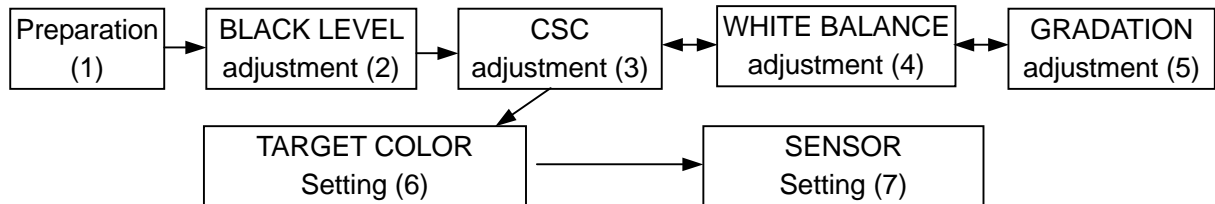
[Procedure]

1. Select HOT EXCHANGE in LAMP CHANGER in MAINTENANCE in the system menu.
2. Set FORBID or ALLOW.

1.5.2. Color balance adjustment

You can adjust luminance and tint between each screen of a display wall. In principle, they should be adjusted according to (3) CSC adjustment. However, follow (2) BLACK LEVEL, (4) WHITE BALANCE and (5) GRADATION adjustments, if necessary.

After that, set TARGET COLOR and SENSOR to maintain the uniformity over the long term.



Color balance adjustment flow chart

1.5.2.1. Preparation

Before the adjustment, set each value according to the following table.

Item	Value	Menu
1 CONTRAST	100	Input memory menu
2 BRIGHTNESS	0	Input memory menu
3 COLOR MATRIX	OFF	Input memory menu
4 WHITE BALANCE	R-GAIN 1000 G-GAIN 1000 B-GAIN 1000	INSTALLATION in system menu
5 WHITE BOOST	OFF	MISC FUNCTION in system menu
6 SENSOR	STOP or OFF	MAINTENANCE in system menu

1.5.2.2. BLACK LEVEL

This adjustment is not necessary.

Adjust it when the difference of luminance and tint in black is noticeable between each screen. Be careful not to deteriorate the contrast because it can be adjusted only by increasing the black luminance level.

[Procedure]

1. Press [TEST] button three times and press [R], [G] and [B] button to display the black signal in the adjustment white.
2. Select BLACK LEVEL in INSTALLATION in the system menu.
3. Select R-, G- or B-LEVEL and adjust each color level in black.

1.5.2.3. CSC (Color Space Control)

There are 3 ways to adjust CSC values.

- By "Auto CSC" function in Wallaby
- With a color analyzer
- By manual

1.5.2.3.1. By "Auto CSC" function

Using "Auto CSC" function in adjustment software, "Wallaby", the color balance can be automatically adjusted among a display wall. See "Auto CSC function" on page 103 for detail.

1.5.2.3.2. With color analyzer

Optimum CSC values can be automatically calculated from the color component data in each screen measured with a specified color analyzer. See separately provided "CSC Auto-adjust Software Operation Manual" for detail.

1.5.2.3.3. By manual

Seeing actual colors on screens, they can be adjusted by manual. Adjusted CSC values can be saved in the memory of either CSC1 or CSC2.

[Procedure]

1. Press [TEST] button three times to display the adjustment white.
2. Select CSC in MAINTENANCE in the system menu.
3. Select CSC1 or CSC2.
4. Press [R], [G] or [B] buttons to display a monochrome color to adjust.
5. Display the monochrome red and if the luminance differs between each screen, adjust the luminance level by decreasing R–R in the brighter screens to align with the darkest screen. (If you made it too dark, increase R–R.)
6. Adjust the tint on the monochrome red finely by increasing or decreasing R–G and R–B, if the tint differs between each screen.
7. Display the monochrome green and adjust G–G in the same way as step 5.
8. Adjust G–R and G–B in the same way as step 6.
9. Display the monochrome blue and adjust B–B in the same way as step 5.
10. Adjust B–R and B–G in the same way as step 6.
11. Display yellow (red + green) and adjust the tint finely by increasing or decreasing R-GAIN and G-GAIN, if the tint differs between each screen.
There are no value indication of R-GAIN, G-GAIN and B-GAIN. If you change them, related CSC values fluctuate in synchronization with the adjustment. For instance of R-GAIN, it changes the values of R–R, R–G and R–B in the same ratio without changing the color balance in red.
12. Display magenta (red + blue) and adjust R-GAIN and B-GAIN in the same way as step 11.
13. Display cyan (green + blue) and adjust G-GAIN and B-GAIN in the same way as step 11.
14. Display white (red + green + blue) and adjust R-GAIN, G-GAIN and B-GAIN in the same way as step 11.
15. Repeat the steps from 4) to 14) so to get uniform the luminance and tint of all the colors.

Note:

Be careful to adjust so that the sums of items: 1+4+7, 2+5+8, 3+6+9 in the following table should not be over 1,023 respectively.

However, when you set SENSOR RUN (to be described later in chapter 1.5.2.7, on page 47), its “gain optimizing function” automatically calculates and set the optimum (maximum limit) values within the range even if it was adjusted over the limit.

Range	Menu	Adjustment value		Displayed color
		Increase	Decrease	
1 0 –1023	R–R	Increasing red luminance	Decreasing red luminance	Red, Yellow, Magenta, White
2 -255 – 255	R–G	Making red yellowy	Making red less yellowy	Red
3 -255 – 255	R–B	Making red bluish	Making red less bluish	Red
4 -255 – 255	G–R	Making green yellowy	Making green less yellowy	Green
5 0 –1023	G–G	Increasing green luminance	Decreasing green luminance	Green, Yellow, Cyan, White
6 -255 – 255	G–B	Making green bluish	Making green less bluish	Green
7 -255 – 255	B–R	Making blue reddish	Making blue less reddish	Blue
8 -255 – 255	B–G	Making blue greenish	Making blue less bluish	Blue
9 0 –1023	B–B	Increasing blue luminance	Decreasing blue luminance	Blue, Magenta, Cyan, White

CSC adjustment item

1.5.2.4. WHITE BALANCE

This adjustment is normally unnecessary. The luminance and tint between screens can be adjusted in CSC.

Used to adjust a color temperature. Three memories: LOW, MIDDLE and HIGH can be used to save in.

[Procedure]

1. Press [TEST] button three times to display the adjustment white.
2. Select WHITE BALANCE in INSTALLATION in the system menu.
3. Select HIGH, MIDDLE or LOW.
4. Adjust R, G and B values.

1.5.2.5. GRADATION

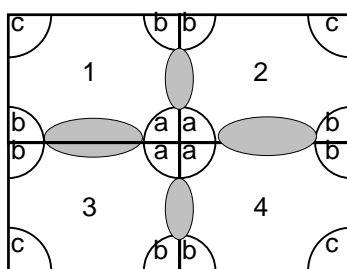
Used to adjust gradation if the differences of luminance/tint level between each screen are prominent.

Set adequate values in consideration of the balance of brightness and uniformity. If you increase it in the plus direction excessively, you have to decrease the total gain.

[Procedure]

(In the instance of a display wall that consists of four screens)

1. Press [TEST] button three times to display the adjustment white.
2. Select GRADATION in MAINTENANCE in the system menu.
3. Select WHITE, R, G or B to open the each gradation adjustment menu.
4. Adjust to match the luminance/tint level in the edge of adjacent screens (gray area in the lower left figure) using the adjustment item A in the lower right table. In this case, align darker parts with brighter, considering uniformity in a single screen.
5. Adjust to match the luminance/tint level in the 4 corners connecting area (area "a" in the lower left figure) using the adjustment item B.
6. Adjust to match the luminance/tint level in the fringe of screens (area "b" and "c"). At first, adjust whole edges with the adjustment item A and then compensate corner areas with the item B.
7. Repeat the steps from 4 to 6 so as to uniform the luminance/tint level of all colors.



Gradation adjustment point

A	TOP	Top edge gradation
	BOTTOM	Bottom edge gradation
	LEFT	Left edge gradation
	RIGHT	Right edge gradation
B	TOP/LEFT	Top left corner gradation
	TOP/RIGHT	Top right corner gradation
	BOTTOM/LEFT	Bottom left corner gradation
	BOTTOM/RIGHT	Bottom right corner gradation

Gradation adjustment item

1.5.2.6. TARGET COLOR

Set it after adjustment of the luminance and tint between screens.

TARGET COLOR can register the adjusted CSC values, color wheel data and lamp data. When the lamp or color wheel is replaced, it can detect the replacement and automatically calculates the optimum CSC values.

[Procedure]

1. Select SET TARGET COLOR in TARGET COLOR in MAINTENANCE in the system menu.
2. Press [ENTER] button in reply to "SET OK?" message.
3. The set timer value (set operating time) is displayed to indicate when TARGET COLOR is set.

1.5.2.7. SENSOR

Set it after adjustment of the luminance and tint between screens.

Even when lamp brightness changes, SENSOR RUN can automatically correct the luminance to keep uniformity across a display wall connected with control cables. When SENSOR is set RUN, WHITE BOOST should be set OFF.

Note:

- CSC, GRADATION and WHITE BALANCE cannot be adjusted during SENSOR RUN.
- When a cube reaches the half of initial brightness, the cube is separated from the brightness control group not to make other cubes too much darker.
- Just after SENSOR is set RUN, you may feel the brightness differs across the display wall. It comes from the gain optimizing function that automatically calculates the optimum (maximum limit) gain values of adjusted CSC and gradation values. The luminous sensor can detect the brightness changing and maintain the uniformity over the long term.

1.5.2.7.1. At initial setting

[Procedure]

1. Make sure WHITE BOOST is set OFF.
2. Select SENSOR in MAINTENANCE in the system menu.
3. Select SET INITIAL SENSOR DATA and press [ENTER] button in reply to "SET OK?" message to obtain the initial sensor value.
4. Switch to SENSOR RUN by right arrow button.

1.5.2.7.2. Color balance readjustment after SENSOR RUN

When you adjust the CSC, GRADATION or WHITE BALANCE after SENSOR RUN setting, SENSOR should be set STOP or OFF.

[Procedure to adjust the color balance of specified cubes in a display wall]

1. Set SENSOR STOP on all cubes in the display wall.
2. Adjust the color balance by CSC etc.
3. Put back SENSOR setting to RUN.

[Procedure to adjust the color balance after replacing all or most of lamps in a display wall]

1. Set SENSOR OFF on all cubes.
2. Adjust the color balance by CSC etc.
3. Follow the same procedure as "At initial setting" described above.

1.5.3. Image set up

1.5.3.1. COLOR MATRIX:USER

This adjustment is normally unnecessary.

Used to adjust the hue of RED, YELLOW, GREEN, CYAN, BLUE or MAGENTA respectively. Normally the optimum option is automatically selected depending on the type of an input signal. The color is available only when you select USER in COLOR MATRIX (on page 55 or 63) in an input memory menu.

[Procedure]

1. Select COLOR MATRIX:USER in INSTALLATION in the system menu.
2. Adjust RED, YELLOW, GREEN, CYAN, BLUE, MAGENTA or SATURATION.

Menu	Range	Adjustment value	
		Increase	Decrease
RED	-20 – 20	Making red yellowy	Making red bluish
YELLOW	-20 – 20	Making yellow greenish	Making yellow reddish
GREEN	-20 – 20	Making green bluish	Making green yellowy
CYAN	-20 – 20	Making cyan bluish	Making cyan greenish
BLUE	-20 – 20	Making blue reddish	Making blue greenish
MAGENTA	-20 – 20	Making magenta reddish	Making magenta bluish
SATURATION	-5 – 5	Making hue brighter	Making under tint

1.5.3.2. AMP GAIN (for ANALOG input)

This adjustment is normally unnecessary.

Used to adjust the gain level of an analog signal in the main input. **It is effective in all input memories.** Normally adjust it for each input memory by the same menu in an input memory (chapter 1.6.3.3, on page 52).

[Procedure]

1. Display a full-white signal through an actual input route.
2. Select AMP GAIN in INSTALLATION in the system menu.
3. Select AUTO GAIN and press [ENTER] button in reply to “AUTO GAIN START?” message.
4. The optimum value is automatically set. The adjustment will finish when “CALCULATE...” indication disappears.

[When “ERROR” is displayed]

An error message is displayed if the input signal level exceeds the adjustment range i.e. the level is too low or too high, or a full-white signal is not input. In such cases, it is necessary to input a signal with the optimum level.

[Manual adjustment]

Normally the AUTO GAIN adjustment is recommended. In special case such as a full-white signal cannot be input, the manual adjustment may be helpful.

1. Select AMP GAIN in INSTALLATION in the system menu.
2. Select MANUAL GAIN.
3. Adjust R/G/B-GAIN or R/G/B-LEVEL respectively.

[NORMAL] button can restore the factory setting values.

1.5.3.3. SCALER AMP GAIN (for S.ANALOG input)

This adjustment is normally unnecessary.

Used to adjust the gain level of analog signal in the input board. **It is effective in all input memories.** Normally adjust it for each input memory by the same menu (chapter 1.7.4.3, on page 59) in input memory.

[Procedure]

1. Display a full-white video signal through actual input route.
2. Select SCALER AMP GAIN in INSTALLATION in the system menu.

From here, follow the same procedure as "AMP GAIN" in the previous chapter.

1.5.3.4. ADV.COL

This adjustment is normally unnecessary.

Used to turn on/off the processing of the colors outside the color range. The initial setting is ON. In ON setting, the area where the color is saturated is smoothed so that the image appears natural without solid colors. **Set the same value on all cubes in a display wall.**

[Procedure]

1. Select ADV.COL in MISC FUNCTION in the system menu.
2. Set ON or OFF.

1.5.3.5. ADV.DARK

This adjustment is normally unnecessary.

Used to turn on/off the function to adjust the image contrast to suit for a bright ambient light. The initial setting is OFF. While a bleached image due to room illumination, ON setting increases the apparent contrast for easy viewing. **Set the same value on all cubes in a display wall.**

[Procedure]

1. Select ADV.DARK in MISC FUNCTION in the system menu.
2. Set ON or OFF.

1.5.3.6. GAMMA

This adjustment is normally unnecessary.

Used to correct the relation between input level and output level of an image signal. The initial setting is 1. **Set the same value on all cubes in a display wall.**

[Procedure]

1. Select GAMMA in MISC FUNCTION in the system menu.
2. Select the setting value from 1 to 5.

As the value decreases, the perceived contrast increases. As the value increases, the luminance level of the middle tone area becomes brighter. Select the value so as to display the optimum image according to the luminance level of the middle tone area.

1.5.3.7. DITHER

This adjustment is normally unnecessary.

Used to set dither. The initial setting is ON. It can increase tone characteristics.

[Procedure]

1. Select DITHER in MISC FUNCTION in the system menu.
2. Set ON or OFF.

1.5.3.8. 3D Y/C (for COMPOSITE input)

This adjustment is normally unnecessary.

Used to turn on/off the three-dimensional Y/C separation circuit. The initial setting is ON. On setting can display an NTSC signal with less dot interference image in COMPOSITE input.

[Procedure]

1. Select 3D Y/C in MISC FUNCTION in the system menu.
2. Set ON or OFF.

1.5.3.9. WHITE BOOST

This adjustment is normally unnecessary.

Used to boost the brightness in white areas of a displaying image utilizing a white segment and blanking areas in the color wheel. The initial setting is ON. When SENSOR is set RUN, WHITE BOOST should be set OFF.

When you set other than OFF, follow the procedure below.

[Procedure]

1. Adjust the color balance (chapter 1.5.2, on page 44) in a state of WHITE BOOST OFF at first.
2. After the adjustment, display the adjustment white by pressing [TEST] button three times.
3. Select WHITE BOOST in MISC FUNCTION in the system menu.
4. Adjust the white boost values as highly as possible so as to align the brightness of the screens.

Note:

- If there is something wrong with the total picture quality on actual contents, set the white boost OFF on all cubes. Also, when you cannot identify the final contents to be displayed, set it OFF.
- This boost function is not effective for a display wall that still has a wide variation of brightness and tint before CSC adjustment. It can be used only in a small display wall system.

1.6. Input memory setting (for the main input)

Press [MENU1] button to display the input memory menus. You can exit the menu by [ESC] button. Be careful that menus for the main input are different from the ones for the input board.

1.6.1. Input port selecting

Input ports can be switched while any menus or test patterns are not displayed.

[Procedure]

1. Press [INPUT A] button to display the input port selecting menu.
2. Select an input port by up/down buttons and press [ENTER] button to change.
3. Press [ESC] button to exit the menu.

The current input port is also displayed in the status information area on screen in advanced mode.



Input port selecting menu

1.6.2. Automatic input signal scanning

While an input memory menu displaying, [NORMAL] button executes the automatic input signal scanning. It searches and displays a signal with a suitable sync frequency in the default memory (preset signals) and in registered input memories.

If multiple signals have a suitable frequency to display, every [NORMAL] button pressing switches the selected signal.

[Procedure]

1. Press [MENU1] button to display the input memory menu.
2. Press [NORMAL] button several times till the correct image is displayed.

If an incorrect image is displayed, perform signal adjustments in the next chapter.

Note:

When the incorrect image is still displayed even after the adjustments, the signal does not comply with the available input signal list (chapter 3.7, on page 94). Only listed signal can be enlarged correctly. Also interlace signals cannot be displayed.

1.6.3. Signal adjustment

1.6.3.1. H.POSITION, V.POSITION

Used to adjust an incorrect image position so as to minimize no signal area on the upper left of the screen.

[Procedure]

1. Select H.POSITION in the input memory menu.
2. Adjust the value by left/right button not to display no signal area on the left of screen.
3. Select V.POSITION in the input memory menu.
4. Adjust the value by left/right button not to display no signal area on the top of screen.

1.6.3.2. FINE (for ANALOG input)

Used to adjust so that noise on an image will be minimized. The adjusting range is -16 – 15 (-32 – 31 in S.ANALOG input).

[Procedure]

1. Select FINE in the input memory menu.
2. Adjust the value so that noise on the output image will be minimized.

If a jitter noise still remains even after H.TOTAL and FINE adjustment, adjust CLOCK RANGE (chapter 1.6.3.11).

1.6.3.3. AMP GAIN (for ANALOG input)

Used to adjust the gain level of an analog signal in the main input. Due to uneven AD converting levels of analog input, colors in each screen look different even if the CSC adjustment is appropriate. **It is effective in each input memory.**

[Procedure]

1. Display a full-white signal through an actual input route.
2. Select AMP GAIN in the input memory menu.
3. Select AUTO GAIN and press [ENTER] button in reply to “AUTO GAIN START?” message.
4. The optimum value is automatically set. The adjustment will finish when “CALCULATE...” indication disappears.

[When “ERROR” is displayed]

An error message is displayed if the input signal level exceeds the adjustment range i.e. the level is too low or too high, or a full-white signal is not input. In such cases, it is necessary to input a signal with the optimum level.

[Manual adjustment]

Normally the AUTO GAIN adjustment is recommended. In special case such as a full-white signal cannot be input, the manual adjustment may be helpful.

1. Select AMP GAIN in the input memory menu.
2. Select MANUAL GAIN.
3. Adjust R/G/B-GAIN or R/G/B-LEVEL respectively.

[NORMAL] button can reset it to the values in AMP GAIN in the system memory (chapter 1.5.3.2, on page 48). If it has not been set, it restores the factory setting values.

1.6.3.4. H.SIZE, V.SIZE (for PH50 and XL50)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust an incorrect size of an effective input image area after H.TOTAL (in ANALOG input) and H.POSITION, V.POSITION adjustment.

[Procedure]

1. Select H.SIZE in the input memory menu.
2. Adjust the horizontal size of the input signal.
3. Select V.SIZE in the input memory menu.
4. Adjust the vertical size of the input signal.

1.6.3.5. FRAME LOCK (for PH50 and XL50)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to set a frame lock. Set ON when frame tearing or field skips are noticeable in a moving image with 50 – 60 Hz of vertical frequency.

- ON: External synchronization mode to synchronize the frame rate to the input signal.
- OFF: Internal synchronization mode to convert the frame rate to an internal rate.

[Procedure]

1. Select FRAME LOCK in the input memory menu.
2. Select ON or OFF.

1.6.3.6. SIGNAL SELECT (for XL21)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to select input signal when the signal obviously matches the available input signal list (chapter 3.7, on page 94) in advance.

[Procedure]

1. Select SIGNAL SELECT in the input memory menu.
2. Select the signal that matches the input signal by up/down buttons.

SIGNAL SELECT

```

640X 480: 60Hz
800X 600: 56Hz
800X 600: 60Hz
1024X 768: 60Hz
1280X 960: 60Hz
1280X1024:60Hz
    
```

SIGNAL SELECT menu

1.6.3.7. H.TOTAL (for ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust a total horizontal dot number of an input signal. Incorrect H.TOTAL value makes vertical striped noises or jitter noises on an image, or whole effective area cannot be displayed even after the image position adjustment.

[Procedure]

1. Select H.TOTAL in the input memory menu.
2. Adjust to eliminate the vertical stripe noises by left/right button.
3. If the horizontal position shifts after the adjustment, adjust H.POSITION (chapter 1.6.3.1, on page 52) again.

1.6.3.8. CLAMP (for ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust a clamp pulse position and the width according to the timing of an input signal. Incorrect CLAMP setting makes whole image darkened and uneven horizontal brightness appears on the image. **CLAMP is automatically set to the optimum value when you set CLAMP START=0, CLAMP WIDTH=0.**

[Procedure]

1. Select CLAMP START in the input memory menu.
2. Adjust the clamp pulse start position.
3. Select CLAMP WIDTH in the input memory menu.
4. Adjust the clamp pulse width.

1.6.3.9. MASK (for ANALOG input in **PH50** and **XL50**)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust when the upper or lower part of an image is distorted while 3-line signal (sync on green) or 4-line signal (composite sync) input.

[Procedure]

1. Select MASK START in the input memory menu
2. Set the maximum value that resolves the image distortion.
3. Select MASK END in the input memory menu.
4. Set the minimum value that resolves the image distortion.

1.6.3.10. SYNC SELECT (for ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to select sync on green setting. The initial setting is AUTO. Set SOG (sync on green) for 5-line (separate sync) or 4-line (composite sync) input with sync on green signals since this clamp pulse on the green channel cannot be adjusted.

[Procedure]

1. Select SYNC SELECT in the input memory menu.
2. Select AUTO or SOG.

1.6.3.11. CLOCK RANGE (for ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically selected when H.TOTAL is set.

Used to set the dot clock frequency of an input signal. If a jitter noise still remains even after H.TOTAL and FINE adjustment, fine-tuning of CLOCK RANGE may improve it.

[Procedure]

1. Select CLOCK RANGE in the input memory menu.
2. Adjust the value to eliminate the jitter noise by left/right buttons.

1.6.4. Image quality adjustment

These adjustments are normally unnecessary.

You can adjust the following items as needed. **Set the same value on all cubes in a display wall.**

1.6.4.1. CONTRAST

Used to adjust contrast. The initial setting is 100. Be noted that an excessive image darkening deteriorates the tone characteristics of darker parts of the image.

[Procedure]

1. Select CONTRAST in the input memory menu.
2. Adjust the value by left/right buttons.

1.6.4.2. BRIGHTNESS

Used to adjust brightness. The initial setting is 0. Be noted that an excessive image darkening deteriorates the tone characteristics of darker parts of the image.

[Procedure]

1. Select BRIGHTNESS in the input memory menu.
2. Adjust the value by left/right buttons.

1.6.4.3. COLOR MATRIX

The optimum option (VIDEO or COMPUTER) is automatically selected in automatic input signal scanning.

Used to set a hue of colors as needed. The initial setting is OFF.

- OFF: Select to turn off the color matrix function.
- VIDEO: Select for a motion image.
- COMPUTER: Select for a signal from a computer.
- USER: Select the user setting adjusted in COLOR MATRIX:USER (chapter 1.5.3.1, on page 48) in the system memory.

[Procedure]

1. Select COLOR MATRIX in the input memory menu.
2. Select OFF, VIDEO, COMPUTER or USER.

1.6.4.4. APERTURE

Used to enhance image edges to emphasize characters etc. in an input image. The initial setting is OFF.

[Procedure]

1. Select APERTURE in the input memory menu.
2. Adjust the value by left/right buttons.

1.6.4.5. SCALING FILTER

Used to set a scaling filter for the main input. The initial setting is 1. If jagged character outlines are noticeable, setting "1" (or "2") makes it smooth. "2" can be selected in **PH50** and **XL50**. "2" makes an image softer. Setting "0" sharpens an image, in particular, a high-resolution image with scale-down.

[Procedure]

1. Select SCALING FILTER in the input memory menu.
2. Adjust the value by left/right buttons.

1.6.5. Input memory saving

The adjusted values can be saved in an input memory. The number of the memories is 128.

Be sure to save when you change the values. Even if the same resolution has already registered in a memory, save the new adjusted values in another input memory if some menus such as FINE or POSITION have different values from the existing memory.

[Procedure]

1. Press [ESC] button during the input memory menu displaying. In reply to "SAVE THE CHANGES?" message, press [ENTER] button. You can exit the menu by [ESC] button without saving.
2. Designate a memory number to save in by left/right buttons and press [ENTER] button.
3. The current setting will be saved in the memory if the number is unregistered. When it has already been registered, the overwrite confirmation message will be displayed.

1.6.6. Input memory calling/deleting

Registered input memories can be called or deleted when needed.

- Call: Press [MEM LIST] button to select INPUT MEMORY. Designate a memory number to be called by left/right buttons and press [ENTER] button.
- Delete: Press [MEM LIST] button to select INPUT MEMORY. Designate a memory number to be deleted by left/right buttons. Select DELETE MEMORY by up/down buttons and press [ENTER] button in reply to "DELETE OK?" message.

1.7. Input memory setting (for the input board)

Press [MENU1] button to display the input memory menus. You can exit the menu by [ESC] button.

1.7.1. Input port selecting

Input ports can be switched while any menus or test patterns are not displayed.

[Procedure]

1. Press [INPUT A] button to display the input port selecting menu.
2. Select an input port by up/down buttons and press [ENTER] button to change.
 - With the RGB input board, S.ANALOG and S.DIGITAL can be selective.
 - With the video input board, COMPOSITE and Y/C additionally will be active.
3. Press [ESC] button to exit the menu.



Input port selecting menu

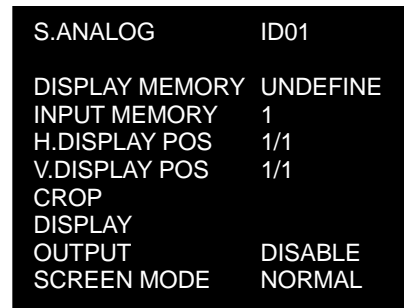
The current input port is also displayed in the status information area on screen in advanced mode.

1.7.2. Expansion setting

To adjust the input signal, set its horizontal and vertical expansion rate to 100 % to display the full size of effective input signal area on screen.

[Procedure]

1. Press [MENU2] button to enter the display memory menu.
2. Select H.DISPLAY POS. and change it to 1/1 by left/right button.
3. Select V.DISPLAY POS. and change it to 1/1 by left/right button.
4. Exit the menu by [ESC] button.



Display memory menu

Note: when you change H.SIZE or V.SIZE (chapter 1.7.4.4, on page 59) in the input memory menu, the H.DISPLAY POS and V.DISPLAY POS should be 1/1 in advance.

1.7.3. Automatic input signal scanning

While an input memory menu displaying, [NORMAL] button executes the automatic input signal scanning. It searches and displays a signal with a suitable sync frequency in the default memory (preset signals) and in registered input memories.

If multiple signals have a suitable frequency to display, every [NORMAL] button pressing switches the selected signal.

[Procedure]

1. Press [MENU1] button to display the input memory menu.
3. Press [NORMAL] button several times till the correct image is displayed.

If an incorrect image is displayed, perform signal adjustments in the next chapter.

Note:

When the incorrect image is still displayed even after the adjustments, the signal does not comply with the available input signal list (chapter 3.7, on page 94).

1.7.4. Signal adjustment

1.7.4.1. H.POSITION, V.POSITION

Used to adjust an incorrect image position so as to minimize no signal area on the upper left of the screen.

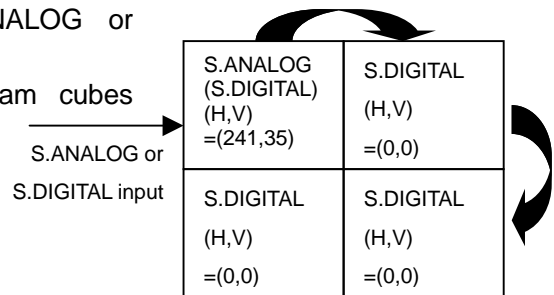
[Procedure]

1. Select H.POSITION in the input memory menu (on the 1st menu sheet).
2. Adjust the value by left/right button not to display no signal area on the left of screen.
3. Select V.POSITION in the input memory menu (on the 1st menu sheet).
4. Adjust the value by left/right button not to display no signal area on the top of screen.

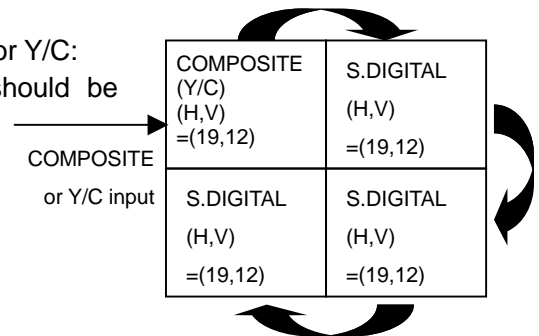
When the digital signal is input from multiple-output device, H.POSITION and V.POSITION should be set (0,0).

When displaying expanded image in a daisy-chained display wall, adjust the position as follows.

- When the external input source is S.ANALOG or S.DIGITAL:
H.POSITION and V.POSITION in downstream cubes should be set (0,0).



- When the external input source is COMPOSITE or Y/C:
H.POSITION and V.POSITION in all cubes should be same.



1.7.4.2. FINE (for S.ANALOG input)

Used to adjust so that noise on an image will be minimized. The adjusting range is -32 – 31 (-16 – 15 in ANALOG input).

[Procedure]

1. Select FINE in the input memory menu (on the 3rd menu sheet).
2. Adjust the value so that noise on the output image will be minimized.

If the noise cannot be improved, adjust SYNC SELECT (chapter 1.7.4.11, on page 62).

1.7.4.3. AMP. GAIN (for S.ANALOG input)

Used to adjust the gain level of an analog signal in the input board. Due to uneven AD converting levels of analog input, colors in each screen look different even if the CSC adjustment is appropriate. **It is effective in each input memory.** It cannot be adjusted when the input signal is YUV signal.

[Procedure]

1. Display a full-white signal through an actual input route.
2. Select AMP GAIN in the input memory menu (on the 4th menu sheet).
3. Select AUTO GAIN and press [ENTER] button in reply to "AUTO GAIN START?" message.
4. The optimum value is automatically set. The adjustment will finish when "CALCULATE..." indication disappears.

[When "ERROR" is displayed]

An error message is displayed if the input signal level exceeds the adjustment range i.e. the level is too low or too high, or a full-white signal is not input. In such cases, it is necessary to input a signal with the optimum level.

[Manual adjustment]

Normally the AUTO GAIN adjustment is recommended. In special case such as a full-white signal cannot be input, the manual adjustment may be helpful.

1. Select AMP GAIN in the input memory menu (on the 4th menu sheet).
2. Select MANUAL GAIN.
3. Adjust R/G/B-GAIN or R/G/B-LEVEL respectively.

[NORMAL] button can reset it to the values in SCALER AMP GAIN in the system memory (chapter 1.5.3.3, on page 49). If it has not been set, it restores the factory setting values.

1.7.4.4. H.SIZE, V.SIZE

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust an incorrect size of an effective input image area after H.TOTAL (in S.ANALOG input) and H.POSITION, V.POSITION adjustment.

[Procedure]

1. Select H.SIZE in the input memory menu (on the 1st menu sheet).
2. Adjust the horizontal size of the input signal.
3. Select V.SIZE in the input memory menu (on the 1st menu sheet).
4. Adjust the vertical size of the input signal.

Note: when you change the H.SIZE or V.SIZE, H.DISPLAY POS and V.DISPLAY POS in the display memory should be 1/1 in advance (chapter 1.7.2, on page 57).

1.7.4.5. FRAME LOCK

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to set a frame lock. Set ON when frame tearing or field skips are noticeable in a moving image with 50 – 60 Hz of vertical frequency.

- ON: External synchronization mode to synchronize the frame rate to the input signal.
- OFF: Internal synchronization mode to convert the frame rate to an internal rate.

[Procedure]

1. Select FRAME LOCK in the input memory menu (on the 1st menu sheet).
2. Select ON or OFF.

1.7.4.6. SCAN MODE (for S.ANALOG or S.DIGITAL input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to select a scan mode as needed when interlace signal is input.

[Procedure]

1. Select SCAN MODE in the input memory menu (on the 1st menu sheet).
2. INTERLACE adjustment
 - OFF: Select for a non-interlace signal.
 - STATIC: Select for an interlace signal for a still image.
 - MOTION: Select for an interlace signal for a motion image.

Note: STATIC and MOTION menus are available only when an interlace signal is input from S.ANALOG or S.DIGITAL port.

3. F-INVERT adjustment

Used to inverse even/odd fields when cross lines on an image are jagged. It is available only when an interlace signal is input from S.ANALOG or S.DIGITAL port.

- ON: Inverting even/odd fields when an interlace signal is input.
- OFF: NOT inverting even/odd fields when an interlace signal is input.

1.7.4.7. SIGNAL SELECT (for COMPOSITE or Y/C input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to select a signal type according to an input signal when an incorrect image is displayed after automatic input signal scanning.

In the case of S.ANALOG and S.DIGITAL input, SIGNAL SELECT menu cannot be adjusted.

[Procedure]

1. Select SIGNAL SELECT in the input memory menu (on the 1st menu sheet).
2. Select a correct input video signal type. If you select AUTO, the suitable signal is automatically set.



SIGNAL SELECT

AUTO
NTSC
PAL
SECAM
NTSC4.43
PAL-M
PAL-N
PAL-60

SIGNAL SELECT menu

1.7.4.8. H.TOTAL (for S.ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust a total horizontal dot number of an input signal. Incorrect H.TOTAL value makes vertical striped noises or jitter noises on an image, or whole effective area cannot be displayed even after the image position adjustment.

[Procedure]

1. Select H.TOTAL in the input memory menu (on the 3rd menu sheet).
2. Adjust to eliminate the vertical stripe noises by left/right button.
3. If the horizontal position shifts after the adjustment, adjust H.POSITION (chapter 1.7.4.1, on page 58) again.

1.7.4.9. CLAMP (for S.ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust a clamp pulse position and the width according to the timing of an input signal. Incorrect CLAMP setting makes whole image darkened and uneven horizontal brightness appears on the image. **CLAMP is automatically set to the optimum value when you set CLAMP START=0, CLAMP WIDTH=0.**

[Procedure]

1. Select CLAMP START in the input memory menu (on the 3rd menu sheet).
2. Adjust the clamp pulse start position.
3. Select CLAMP WIDTH in the input memory menu (on the 3rd menu sheet).
4. Adjust the clamp pulse width.

1.7.4.10. MASK (for S.ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to adjust when the upper or lower part of an image is distorted while 3-line signal (sync on green) or 4-line signal (composite sync) input.

[Procedure]

1. Select MASK START in the input memory menu (on the 3rd menu sheet).
2. Set the maximum value that resolves the image distortion.
3. Select MASK END in the input memory menu (on the 3rd menu sheet).
4. Set the minimum value that resolves the image distortion.

1.7.4.11. SYNC SELECT (for S.ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to select sync on green setting. The initial setting is AUTO. HD/VD may make FINE easier to match in 5-line input (separate sync). Set SOG (sync on green) for 5-line (separate sync) or 4-line (composite sync) input with sync on green signals since this clamp pulse on the green channel cannot be adjusted.

- AUTO: Select to set the optimum signal automatically.
- HD/VD: Select for a 5-line input signal.
- SOG: Select for an input signal with sync on green signals.

[Procedure]

1. Select SYNC SELECT in the input memory menu (on the 4th menu sheet).
2. Select AUTO, HD/VD or SOG.

1.7.4.12. CLOCK RANGE (for S.ANALOG input)

This adjustment is normally unnecessary. The optimum value is automatically selected when H.TOTAL is set.

Used to set the dot clock frequency of an input signal. The displayed values and corresponding dot clock frequencies are shown in following tables.

[Procedure]

1. Select CLOCK RANGE in the input memory menu (on the 4th menu sheet).
2. Adjust the value by left/right buttons.

With VC-B50KA

CLOCK RANGE	1	2	3	4	5	6	7	8	9
Dot clock [MHz]	- 20	20 – 28	28 – 38	38 – 45	*	*	45 – 61	61 – 77	77 – 82
CLOCK RANGE	10	11	12	13	14	15	16	17	18
Dot clock [MHz]	*	*	82 – 122	122 – 146	*	*	146 –	*	*

*) Dot clock frequency is maintained even if the clock range number changes.

With VC-B20KA

CLOCK RANGE	5	6	7	8	9	10	11
Dot clock [MHz]	21.25 – 27.5	27.5 – 35	35 – 38.75	38.75 – 40	40 – 42.5	42.5 – 55	55 – 70
CLOCK RANGE	12	13	14	15	16	17	18
Dot clock [MHz]	70 – 77.5	77.5 – 80	80 – 85	85 – 110	110 – 140	140 – 155	155 – 165

1.7.4.13. SIGNAL TYPE (for S.ANALOG or S.DIGITAL input)

This adjustment is normally unnecessary. The optimum value is automatically set in automatic input signal scanning.

Used to switch an input signal type according to an input signal. Adjust it when an incorrect image is displayed after automatic input signal scanning.

[Procedure]

1. Select SIGNAL TYPE in the input memory menu (on the 4th or 2nd menu sheet).
2. Select RGB, YPbPr or YCbCr (RGB or YUV with VC-B20KA) according to the input signal.

1.7.5. Image quality adjustment

These adjustments are normally unnecessary.

You can adjust the following items as needed. **Set the same value on all cubes in a display wall.**

1.7.5.1. CONTRAST

Used to adjust contrast. The initial setting is 100. Be noted that an excessive image darkening deteriorates the tone characteristics of darker parts of the image.

[Procedure]

1. Select CONTRAST in the input memory menu (on the 2nd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.2. BRIGHTNESS

Used to adjust brightness. The initial setting is 0. Be noted that an excessive image darkening deteriorates the tone characteristics of darker parts of the image.

[Procedure]

1. Select BRIGHTNESS in the input memory menu (on the 2nd menu sheet).
2. Adjust the value by left/right buttons

1.7.5.3. COLOR MATRIX

The optimum option (VIDEO or COMPUTER) is automatically selected in automatic input signal scanning.

Used to set a hue of colors as needed. The initial setting is OFF.

- OFF: Select to turn off the color matrix function.
- VIDEO: Select for a motion image.
- COMPUTER: Select for a signal from a computer.
- USER: Select the user setting adjusted in COLOR MATRIX:USER (chapter 1.5.3.1, on page 48) in the system memory.

[Procedure]

1. Select COLOR MATRIX in the input memory menu (on the 2nd menu sheet).
2. Select OFF, VIDEO, COMPUTER or USER.

1.7.5.4. APERTURE

Used to enhance image edges to emphasize characters etc. in an input image. The initial setting is OFF.

[Procedure]

1. Select APERTURE in the input memory menu (on the 2nd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.5. ASPECT-RATIO

The optimum value is automatically set in automatic input signal scanning.

It is available when SCREEN MODE (chapter 1.8.6, on page 67) in the display memory menu is set NORMAL or TRIMMING.

- 4:3 : The image is displayed at the aspect ratio of 4:3.
- 5:4 : The image is displayed at the aspect ratio of 5:4.
- 16:9 : The image is displayed at the aspect ratio of 16:9.

[Procedure]

1. Select ASPECT-RATIO in the input memory menu (on the 2nd menu sheet).
2. Select 4:3, 5:4 or 16:9.

1.7.5.6. SCALING FILTER

Used to set a scaling filter for the input board. The initial setting is 1. If jagged character outlines are noticeable, setting "1" or "2" makes it smooth. "2" makes an image softer. Setting "0" sharpens an image, in particular, a high-resolution image with scale-down.

[Procedure]

1. Select SCALING FILTER in the input memory menu (on the 2nd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.7. COLOR (for COMPOSITE or Y/C input)

Used to adjust a color depth of an image. The initial setting is 0.

[Procedure]

1. Select COLOR in the input memory menu (on the 3rd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.8. TINT (for COMPOSITE or Y/C input)

Used to adjust a hue of an image. The initial setting is 0. It is effective only for NTSC signals.

[Procedure]

1. Select TINT in the input memory menu (on the 3rd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.9. SHARPNESS (for COMPOSITE or Y/C input)

Used to adjust to sharpen or soften an image. The initial setting is 0. Be noted that an excessive value increasing causes noises on an image.

[Procedure]

1. Select SHARPNESS in the input memory menu (on the 3rd menu sheet).
2. Adjust the value by left/right buttons.

1.7.5.10. VCR MODE (for COMPOSITE or Y/C input with VC-B20KV)

Used to compensate incorrect colors in a particular VCR. The initial setting is OFF.

[Procedure]

1. Select VCR MODE in the input memory menu (on the 3rd menu sheet).
2. Select ON or OFF.

1.7.6. Input memory saving

The adjusted values can be saved in an input memory. The number of the memories is 128.

Be sure to save when you change the values. Even if the same resolution has already registered in a memory, save the new adjusted values in another input memory if some menus such as FINE or POSITION have different values from the existing memory.

[Procedure]

1. Press [ESC] button during the input memory menu displaying. In reply to "SAVE THE CHANGES?" message, press [ENTER] button. You can exit the menu by [ESC] button without saving.
2. Designate a memory number to save in by left/right buttons and press [ENTER] button.
3. The current setting will be saved in the memory if the number is unregistered. When it has already been registered, the overwrite confirmation message will be displayed.

1.7.7. Input memory calling/deleting

Registered input memories can be called or deleted when needed.

- Call: Press [MEM LIST] button to select INPUT MEMORY. Designate a memory number to be called by left/right buttons and press [ENTER] button.
- Delete: Press [MEM LIST] button to select INPUT MEMORY. Designate a memory number to be deleted by left/right buttons. Select DELETE MEMORY by up/down buttons and press [ENTER] button in reply to "DELETE OK?" message.

1.8. Display memory setting (for the input board)

Used to set an image position and expansion ratio for the input board signals to display on a display wall.

Press [MENU2] button to display the display memory menus. You can exit the menu by [ESC] button. There is no need to register the display memory when the input board is not attached. In this case, the display memory menu is not displayed.

1.8.1. INPUT MEMORY

Used to designate an input image signal to be displayed.

[Procedure]

1. Select INPUT MEMORY in the display memory menu.
2. Select an input memory number to be displayed. Current displaying memory is called at first. If the input memory has not been saved, it displays "BLANK MEMORY" and the display memory cannot be saved. In this case, save the input memory in advance (chapter 1.7.6, on page 65).

1.8.2. H.DISPLAY POS, V.DISPLAY POS

Used to adjust an image position and expansion ratio according to a configuration.

[Procedure]

1. Select H.DISPLAY POS. or V. DISPLAY POS in the display memory menu.
2. Set the values of H.DISPLAY POS. and V. DISPLAY POS. The "n" of n/m indicates the panel position in the vertical and horizontal directions. The "m" indicates the total number of screens in the directions. To display an un-scaled image on each cube, set the both menus 1/1.
 - For the detail setting for daisy-chained display walls, see "1.9 Setting as daisy chain connection" on page 69.
 - DISPLAY menu (chapter 1.8.4, on page 67) can tweak an unmatched image linkage between screens.

1.8.3. CROP

This adjustment is normally unnecessary. The optimum value is automatically renewed when H./V. DISPLAY POS. are changed.

Used to clip a partial area from an effective image area by manual. The adjustment is required only in a specific case.

- H.POSITION: The horizontal starting position of the partial area.
- V.POSITION: The vertical starting position of the partial area.
- H.SIZE: The horizontal size of the partial area.
- V.SIZE: The vertical size of the partial area.

[Procedure]

1. Select CROP in the display memory menu.
2. Adjust each item.

Note: It will be automatically renewed when H./V. DISPLAY POS. are changed.

1.8.4. DISPLAY

This adjustment is normally unnecessary. The optimum value is automatically renewed when H./V. DISPLAY POS. are changed.

Used to designate a display area on screen by manual. It can tweak an unmatched image linkage between screens.

- H.POSITION: The horizontal starting position of the display area.
- V.POSITION: The vertical starting position of the display area.
- H.SIZE: The horizontal display size. It can erase a noise on a side of images.
- V.SIZE: The vertical display size. It can erase a noise on the top or bottom of images.

[Procedure]

1. Select DISPLAY in the display memory menu.
2. Adjust each item.

Note:

- It will be automatically renewed when H./V. DISPLAY POS. are changed.
- H.SIZE and V.SIZE are not required to adjust when H./V. DISPLAY POS is set 1/1 to display an un-scaled image.

1.8.5. DIGITAL OUT

Used to designate a signal to be output from the digital output terminal. The initial setting is SCREEN. A registered input memory for the input board can be optionally selected. Input memories for the main input cannot be designated.

- DISABLE: No signal to be output.
- SCREEN: Current displaying image on screen is output.
- 1 – 128: The adjustments in the designated input memory 1 – 128 are reflected on the output signal.

[Procedure]

1. Select DIGITAL OUT in the display memory menu.
2. Select a signal to be output from the digital output terminal.

Note: Different input memories in the same input port cannot be designated as both the digital out and the on screen display simultaneously. Also it is unable to designate COMPOSITE and Y/C as well.

1.8.6. SCREEN MODE

Used to set when the aspect ratio of an input signal is different from the screen to display.

- NORMAL: The original aspect ratio is maintained to display whole image at the center of the screen. The margins are displayed black.
- TRIMMING: The original aspect ratio is maintained and the image is enlarged to fill the entire screen. An HDTV image with 16:9 aspect ratio is cut the right and left edges.
- FULL: The aspect ratio is adjusted to fill the whole image in the entire screen. The image with 16:9 aspect ratio appears stretching vertically.

[Procedure]

1. Select SCREEN MODE in the display memory menu.
2. Select NORMAL, TRIMMING or FULL.

Note: The original aspect ratio is set in ASPECT-RATIO menu (chapter 1.7.5.5, on page 64). Even if the effective image area is 16:9, when it is set 4:3 in ASPECT-RATIO menu, the image is processed as 4:3.

1.8.7. Display memory saving

The adjusted values can be saved in a display memory. The number of the memories is 256.

For the saving, an input memory number is required in INPUT MEMORY menu (chapter 1.8.1, on page 66). If the input memory has not been registered, save the input memory in advance (chapter 1.7.6, on page 65).

[Procedure]

1. Press [ESC] button during the display memory menu displaying. In reply to "SAVE THE CHANGES?" message, press [ENTER] button. You can exit the menu by [ESC] button without saving.
2. Designate a memory number to save in by left/right buttons and press [ENTER] button.
3. The current setting will be saved in the memory if the number is unregistered. When it has already been registered, the overwrite confirmation message will be displayed.

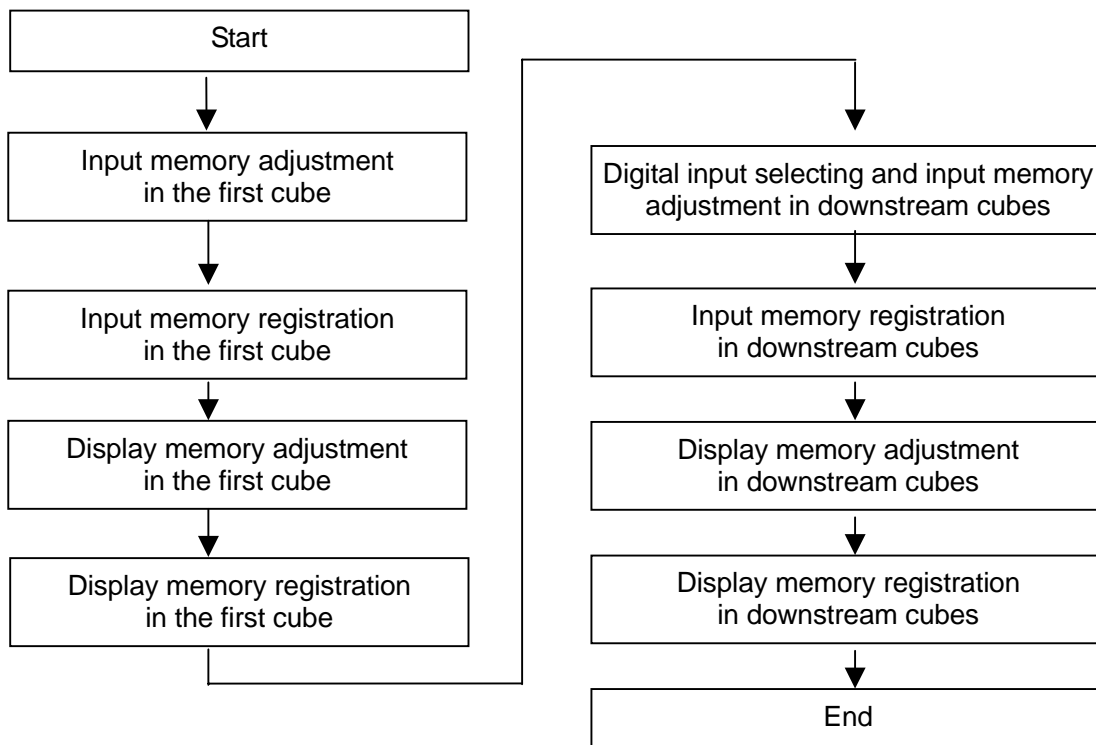
1.8.8. Display memory calling/deleting

Registered display memory can be called or deleted when needed.

- Call: Press [MEM LIST] button to select DISPLAY MEMORY. Designate a memory number to be called by left/right buttons and press [ENTER] button. Or it can be called directly by 3-digit number with number buttons in the remote control. When you call the display memory 1, press 001.
- Delete: Press [MEM LIST] button to select DISPLAY MEMORY. Designate a memory number to be deleted by left/right buttons. Select DELETE MEMORY by up/down buttons and press [ENTER] button in reply to "DELETE OK?" message.

1.9. Setting as daisy chain connection (for the input board)

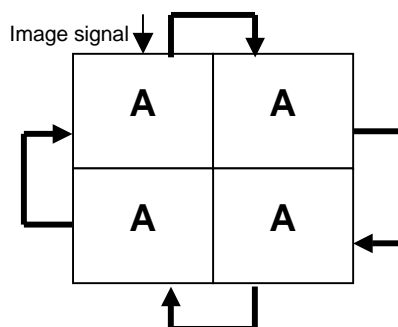
The adjustment procedure of a daisy-chained display wall is shown in the following flowchart. Adjust the first cube, which takes an input signal from an external device, following which, adjust other downstream cubes that require a digital image signal from the first cube.



Daisy-chained display wall adjustment flowchart

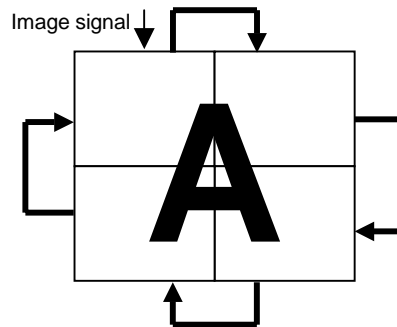
[Procedure]

1. Adjust and save the input memory and the display memory of the first cube according to “1.7 Input memory setting (for the input board)” on page 57 and “1.8 Display memory setting” on page 66.
2. Select DIGITAL port in other downstream cubes according to “1.7.1 Input port selecting” on page 57.
3. Adjust and save the input memory and the display memory of the downstream cubes in the same way as the first cube. Normally it is unnecessary to change the input signal position. It is automatically set in automatic input signal scanning (chapter 1.7.3, on page 57). Make certain that same images are displayed on each screen as the following example.



- Set the position and expansion ratio (“1.8.2 H.DISPLAY POS, V.DISPLAY POS” on page66) again to fit a configuration in reference to the following setting sample in left side. Check the displaying to be as the example in right side.

H=1/2 V=1/2	H=2/2 V=1/2
H=1/2 V=2/2	H=2/2 V=2/2



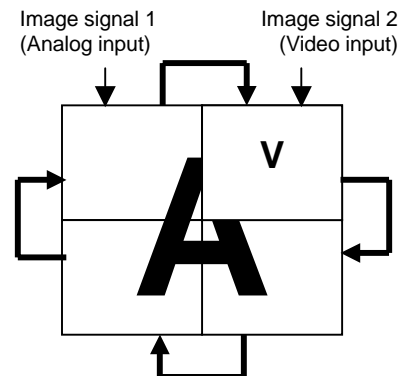
- Set SCREEN MODE (chapter 1.8.6, on page 67) as needed.
- Save the display memory (chapter 1.8.7, on page 68) of each screen in a different memory number from a previous saving.
- Check the image linkage between screens. If it is insufficient, you can tweak by OFFSET menu (chapter 1.5.1.7, on page 38). Be careful if you adjust it by the display memory setting, the linkage condition may change when you display other images.

You can also display different input images in the same time.

It is an example that an analog signal A is input to panel 1 (upper left) and a video (COMPOSITE) signal V is input to panel 2 (upper right). Each screen is connected with daisy chain.

[Procedure]

- Select COMPOSITE port in the panel 2 according to “1.7.1 Input port selecting” on page 57.
- Adjust the input memory setting in the panel 2 as needed.
- Save the input memory in a different memory number from a previous saving.
- Set the display memory in the panel 2 as below.
INPUT MEMORY: the input memory for the video input set in the step 10.
H.DISPLAY POS.: 1/1
V.DISPLAY POS.: 1/1
DIGITAL OUT: the input memory for the digital input set in the step 3.

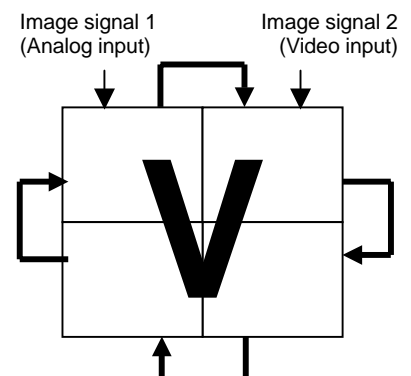


- Make certain to display the video signal V on the panel 2 as described above.
- Save the display memory in a different memory number from a previous saving.

You can switch these image displays.

[Procedure]

- Regarding the panel 2 as a first cube, follow the same procedure as step 2 to 7 to display as shown in the right figure.
- Call display memories (set in the step 3, 6 13 or 15) to switch the display depending on cases.



2. Regular maintenance

2.1. Lamp replacement

This product is equipped with lamp(s) to project images.

The lamp is a consumable. It may burn out or the brightness may decrease during operation. In such cases, replace the lamp with a new one as soon as possible. When the lamp doesn't illuminate any more, a blue light blinks on the screen and error indicator in the control panel shows "1." (chapter 3.5, on page 91).

Changer can detect a lamp failure or brightness deterioration to swap it for a spare lamp automatically (Auto-lamp changing function: in chapter 2.1.3, on page 78). After the swapping, "☀" mark starts blinking on the screen. Replace the swapped lamp with a new one soon. If the spare lamp is also a failed one, the blue light blinks on the screen and the error indicator shows "1."

Be sure to use optional lamps specified for the product.

S-PH50LA (for **Changer**)

S-XL50LA (for **Single**)

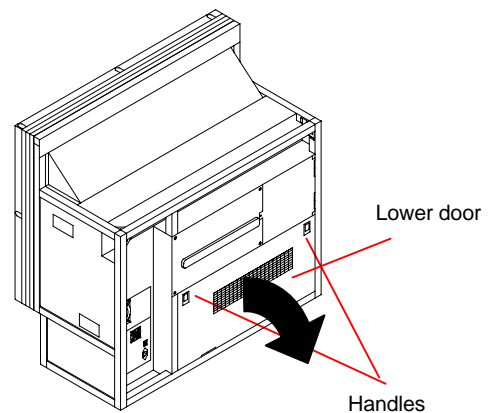
2.1.1. Safety precautions

- A high-pressure mercury lamp is used as the light source of this product. The high-pressure mercury lamp can explode or fail to illuminate permanently because of an impact, scratch, or deterioration through use. The period of time until explosion or permanent failure to illuminate varies considerably from lamp to lamp depending on operation conditions, etc. Therefore, the lamp may explode soon after you use it for the first time.
- Do not shake a removed lamp or do not lift it above your face. You may be injured in your eye by flying or falling glass fragments.
- The lamp gets very hot during operation. Do not replace the lamp immediately after operation because you may get burned or injured.
- In **Single**, be sure to turn off the main power switch and unplug the power cord from the wall outlet before replacing the lamp. And wait at least one hour to allow the lamp to cool down enough to the touch. Lamp replacement without turning off the main power may result in electric shock.
- Replace the lamp with drawing on thick gloves. The lamp is heated for a while even if the lamp is turned off.
- Insert the lamp firmly. When the lamp isn't installed properly, it won't illuminate. Improper installation may result in fire.
- When you open the doors or lamp cover for the purpose of lamp replacement, do not touch any parts inside that are not necessary for lamp replacement because you may get injured or a failure may occur.
- Do not remove screws other than specified. Removal of unspecified screws may result in a failure.
- Do not put metals or flammable objects into the product. Using the product with any foreign objects inside may result in electric shock or fire.

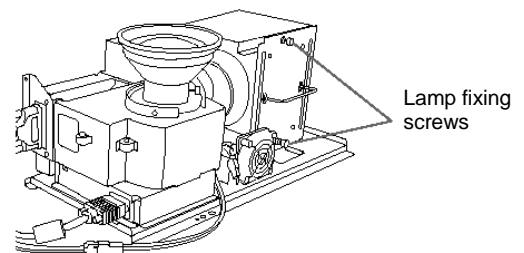
2.1.2. Procedure

2.1.2.1. For Single

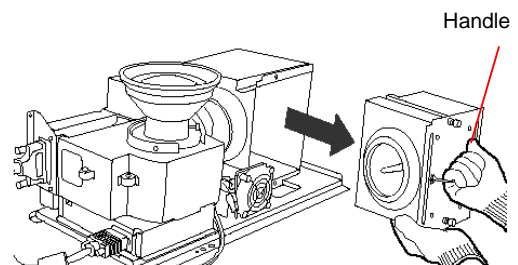
1. **Rear**: Hold down the handles by the fingers and pull the lower door to open.
Front: Open the screen unit (chapter 1.2.7.1, on page 21).



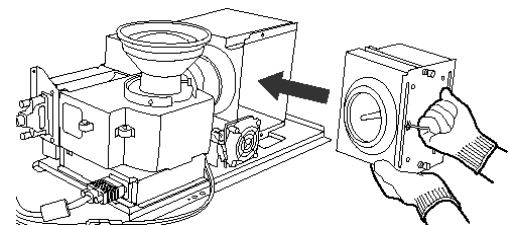
2. Turn off the main power switch and unplug the power cord from the wall outlet.
3. Loosen the two lamp fixing screws.



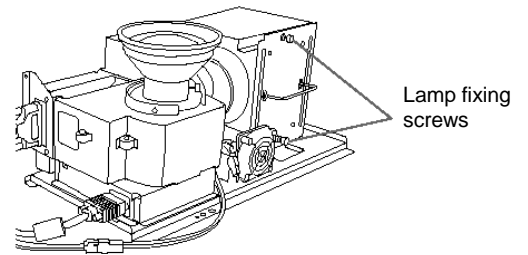
4. Hold the handle and pull out the lamp.
 - Be sure to grip the handle with one hand and hold the lamp with the other hand to pull it out safely.
 - Do not touch the glass envelope of the lamp. It may burn you.



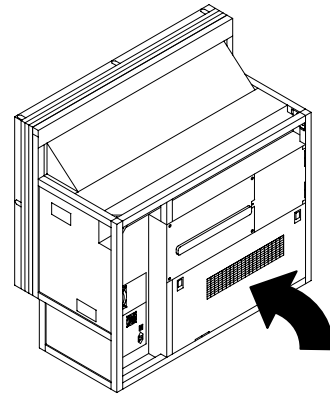
5. Insert a new lamp into the lamp chamber to the end.
 - Do not touch the glass envelope of the lamp by your fingers. Oil on your fingers may cause damage or explosion of the lamp.
 - Be sure to grip the handle with one hand and hold the lamp with the other hand to insert it safely. Be careful not to pinch your hand in the lamp chamber.



6. Tighten the two lamp fixing screws.



7. **Rear**: Close the lower door.
Front: Perform "Dust filter cleaning" (chapter 2.4.3, on page 83) as needed, and close the screen unit (chapter 1.2.7.2, on page 22).



8. After the replacement, perform "Condenser lens adjustment" (chapter 2.2, on page 81), "Color balance adjustment" (chapter 1.5.2, on page 44) or "Picture outline adjustment" (chapter 1.4.3, on page 28) as needed.
 - You don't have to reset the lamp timer value since the lamp operating time is automatically updated when a lamp is replaced. As needed, you can reset it manually in LAMP TIMER RESET in MAINTENANCE in the system menu.
 - If TARGET COLOR (chapter 1.5.2.6, on page 47) has been set, the color is automatically adjusted to be optimal at lamp replacement.
 - If SENSOR (chapter 1.5.2.7, on page 47) has been set RUN, the brightness is automatically adjusted to be uniform across a display wall.

2.1.2.2. For **Changer**

With HOT EXCHANGE menu (chapter 1.5.1.18, on page 43), you can set the allowance the replacement while main lamp lighting.

In the FORBID setting, the product automatically shuts down when you open the lamp cover.

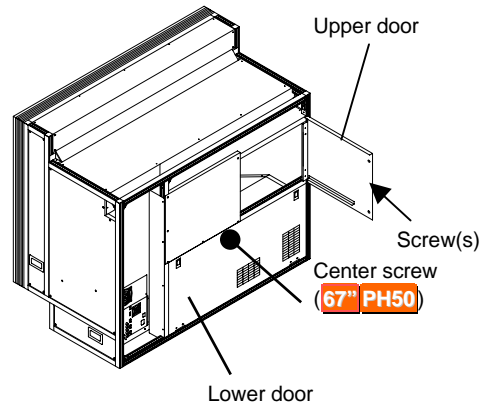
In the ALLOW setting, take care not to burn your hands when you replace a spare lamp during main lamp operation.

To prevent burn or injury, it is recommended to turn off the main power switch and unplug the power cord from the wall outlet before the replacement.

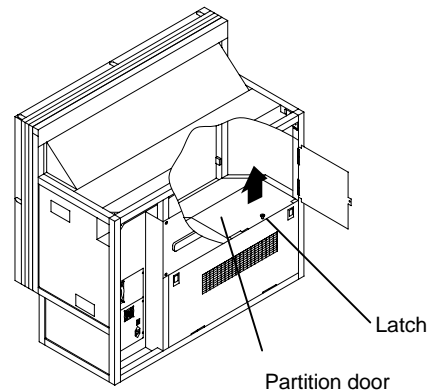
1. **Rear**: Loosen screw(s) in the upper door to open.

In **67" PH50**, turn the center screw in the lower door 90 degrees anti-clockwise to unlock with Allen wrench (4mm) to open the door. (Go to step 4).

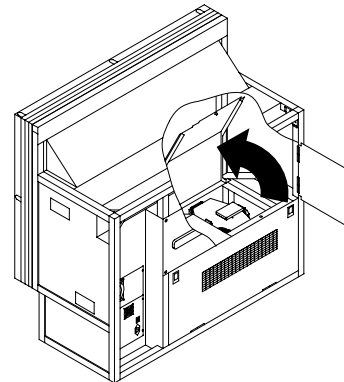
Front: Open the screen unit (chapter 1.2.7.1, on page 21). (Go to step 4)



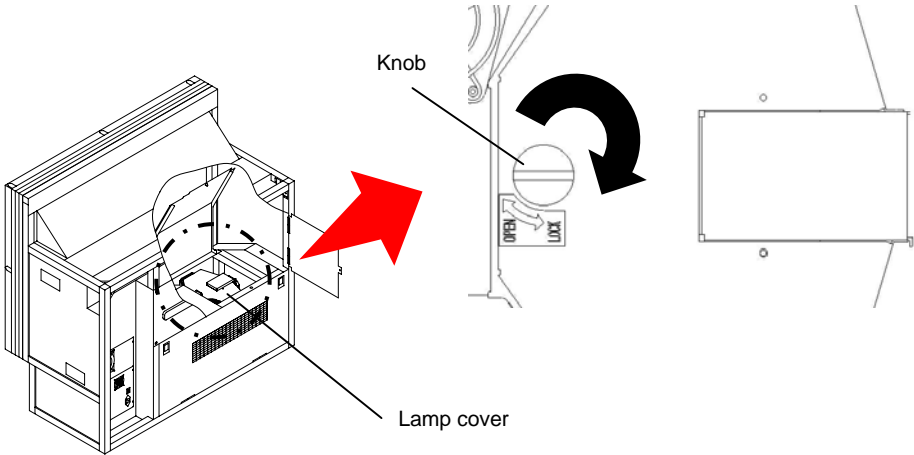
2. **Rear**: Lift up the latch in the partition door. (No need in **67" PH50**.)



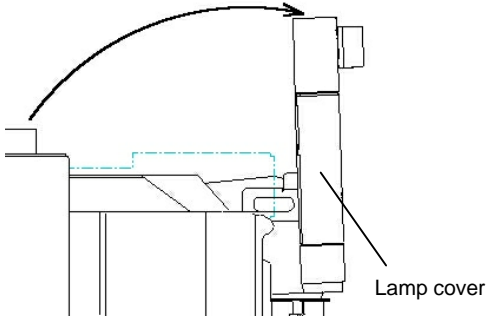
3. **Rear**: Open the partition door. (No need in **67" PH50**.)



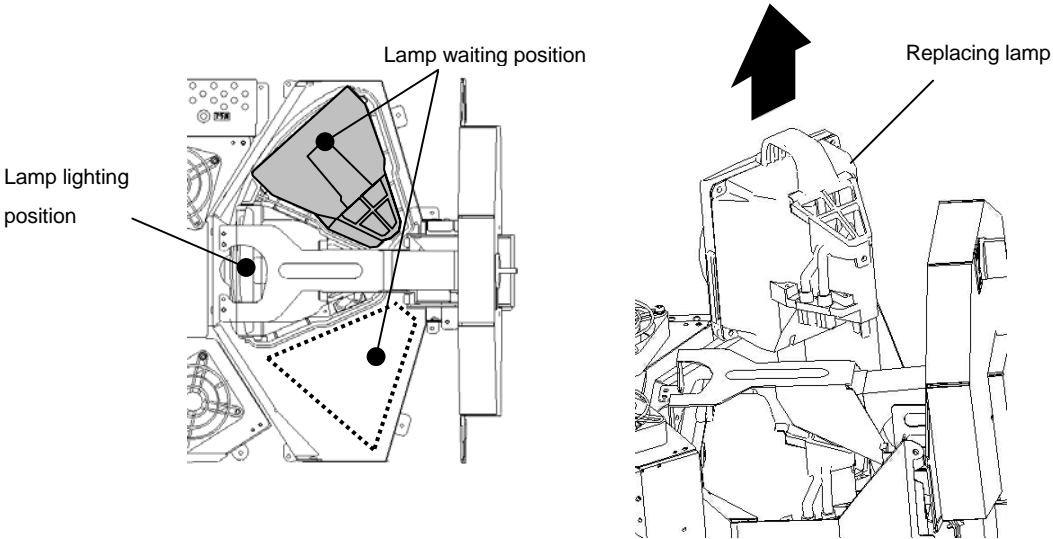
- 4. To unlock the lamp cover in the right side of the optical unit, turn the knob clockwise.



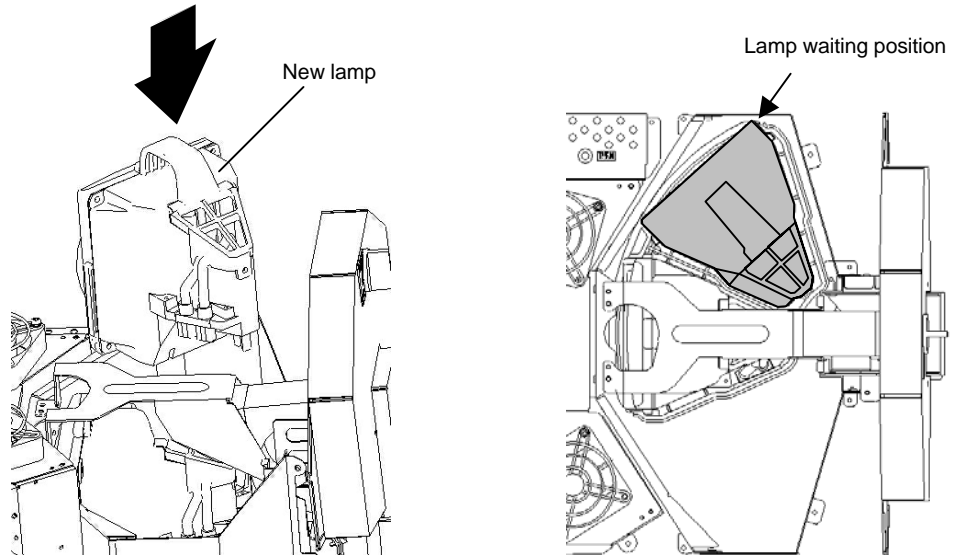
- 5. Open the lamp cover.



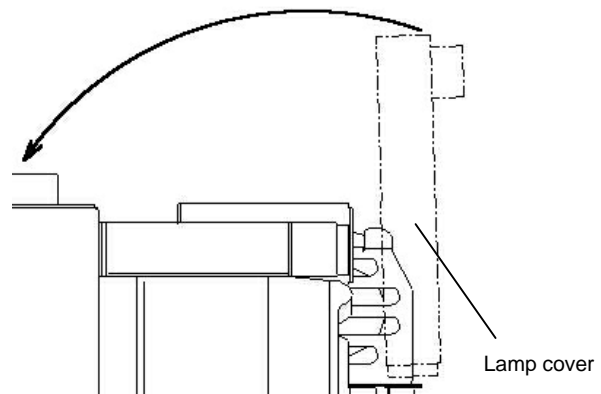
- 6. Pull out the spare lamp from the lamp waiting position.
 - Pull out the lamp with right angle. Rough treatment may cause damage.
 - To replace the lamp in the lighting position, move it to the waiting position in advance by manual lamp swap (chapter 2.1.3.3, on page 79).
 - Do not touch the glass envelope of the lamp. It may burn you.



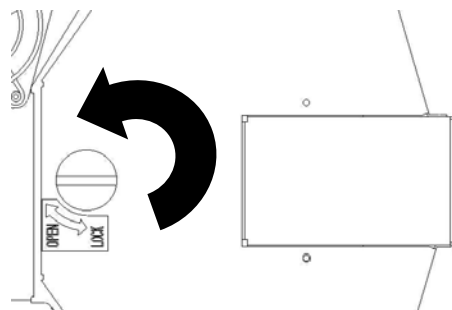
7. Insert a new lamp with correct direction to the end.
- Insufficient inserting may cause damage.
 - Do not touch the glass envelope of the lamp by your fingers. Oil on your fingers may cause damage or explosion of the lamp.



8. Close the lamp cover.

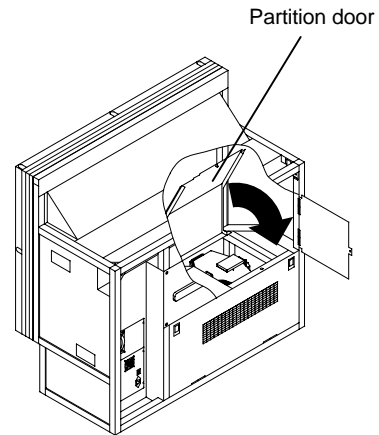


9. Lock the lamp cover.
- If you neglect to lock it, the lamp changer may not work correctly.

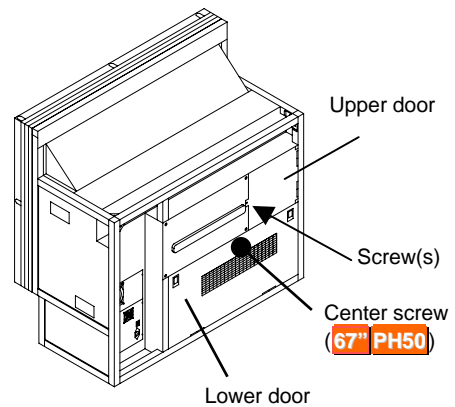


10. **Front**: Perform “Dust filter cleaning” (chapter 2.4.3, on page 83) as needed, and close the screen unit (chapter 1.2.7.2, on page 22) (go to step 13).

11. **Rear**: Close the partition door and push the latch till click.
(No need in **67” PH50**.)



12. **Rear**: Close the upper door and tighten the screw(s) loosened in the step 1.
In **67” PH50**, tighten the center screw in the lower door to close.



13. After the replacement, perform “Color balance adjustment” (chapter 1.5.2, on page 44) or “Picture outline adjustment” (chapter 1.4.3, on page 28) as needed.
- To turn on the lamp in the waiting position, move it to the lighting position in advance by manual lamp swap (chapter 2.1.3.3, on page 79).
 - You don’t have to reset the lamp timer value since the lamp operating time is automatically updated when a lamp is replaced. As needed, you can reset it manually in LAMP TIMER RESET in MAINTENANCE in the system menu.
 - If TARGET COLOR (chapter 1.5.2.6, on page 47) has been set, the color is automatically adjusted to be optimal at lamp replacement.
 - If SENSOR (chapter 1.5.2.7, on page 47) has been set RUN, the brightness is automatically adjusted to be uniform across a display wall.

2.1.3. Auto-lamp changing function (for **Changer**)

Changer is equipped with the auto-lamp changing function that can detect a lamp failure or a brightness deterioration to swap it for a spare lamp automatically.

The lamp is managed as three types of status, “NEW”, “USED” and “JUNK”. It is displayed on screen by [DISPLAY] button.

- NEW: New or not-deteriorated lamp
- USED: Deteriorated lamp below the threshold set in CHANGE MODE menu (chapter 1.5.1.18.2, on page 43)
- JUNK: Failed lamp

5 minutes after the auto-lamp changing, the lamp can be automatically adjusted to the suitable position to maximize the brightness (chapter 2.1.3.4, on page 79), and the initial brightness is automatically read. If you turn off the power during the auto-lamp changing, the initial value will be read in the same way when you will turn on again.

2.1.3.1. Action in lamp failure (burnout or explosion)

When a lamp failure is detected, the lamp is automatically swapped for a spare lamp.

1. When it detects a lamp failure, the lamp status is automatically recognized as “JUNK” and memorized in the lamp memory.
2. If the spare lamp status is “NEW” or “USED”, the auto-lamp changing starts. “☼” mark starts blinking on the screen to induce to replace the spare lamp (chapter 2.1.3.5, on page 80).
3. If the spare lamp status is “JUNK”, the product tries to ignite the current lamp once without auto-lamp changing. If it succeeds to ignite, it continues to work. Otherwise, the error indicator shows “1.” (chapter 3.5, on page 91).

Even if the status is “JUNK”, in the case that you have cycled the power during this status, the auto-lamp changing starts. If it succeeds to ignite, it continues to work. Otherwise, the error indicator shows “1.”.

2.1.3.2. Action in brightness deterioration

When the luminous sensor detects a brightness deterioration, the lamp is automatically swapped for a spare lamp.

1. When the luminous sensor detects brightness deterioration, the lamp status is automatically recognized as “USED” and memorized in the lamp memory.
2. If the spare lamp status is “NEW”, the pre-announcement of auto-lamp changing is displayed on screen and the auto-lamp changing starts 5 minutes later. “☼” mark starts blinking on the screen to induce to replace the spare lamp (chapter 2.1.3.5, on page 80).
3. If the spare lamp status is “USED” or “JUNK”, the current lamp is not swapped to keep lighting.

In CHANGE MODE menu (chapter 1.5.1.18.2, on page 43), you can set the brightness to start the auto-lamp changing. There are three types of condition, 50% of initial brightness (NORMAL), 30% of initial brightness (LONG) or no swap due to brightness deterioration (OFF). The initial setting is NORMAL.

2.1.3.3. Manual lamp swap

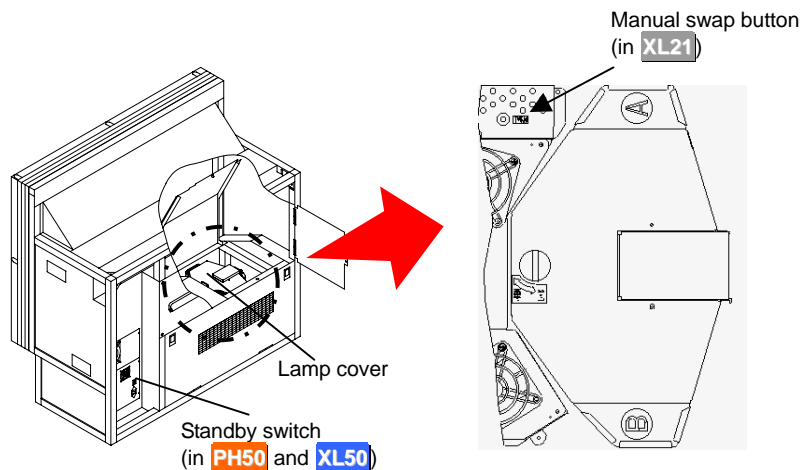
In **Changer**, regardless of lamp failure or brightness deterioration, you can swap lamps by manual. During the swap, the lamp cover must be closed.

At lamp lighting, it automatically turns off the current lamp and swaps it with the spare lamp to light. At stand-by state, it automatically turns on the power and swaps the current lamp with the spare. Then the product shuts down to go back to the stand-by state.

[Procedure]

Press [INPUT B], [ESC] and [2-digit remote ID number] buttons in the remote control consecutively. When the ID is 01, press [INPUT B], [ESC], [0] and [1]. Pressing [INPUT B], [ESC], [0] and [0] swaps lamps regardless of remote ID setting.

You can also swap by pressing-and-hold the standby switch on the control panel in **PH50** and **XL50** or by pressing manual swap button on the lamp changer in **XL21**.



2.1.3.4. Lamp position auto calibration

Changer has a function that can automatically adjust a lamp to the suitable position to maximize the brightness, which is performed 5 minutes after the lamp swap.

Once calibrated, the result is automatically saved in the optical unit and it will not be re-calibrated until the next swap is detected.

For instance, it calibrates 5 minutes after lighting a lamp that is different from a previous one, or 5 minutes after the auto-lamp changing. If you turn on the power to ignite the same lamp, the auto calibration will not be performed since the lamp position is automatically set according to the memorized result.

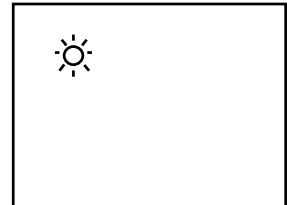
2.1.3.5. Warning indication

Changer can indicate a warning mark to induce to replace the spare lamp and a pre-announcement of auto-lamp changing on screen. It can be set in WARNING menu in INDICATION in the system menu (chapter 1.5.1.11, on page 40). Or you can also select no indication setting.

[Warning mark to induce to replace the spare lamp]

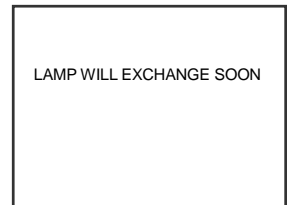
“☀” mark is displayed on screen when a spare lamp is required to replace after the auto-lamp changing (in other word, when spare lamp status is “USED”, “JUNK” or no attaching). It blinks once in 5 seconds.

The mark will disappear when the spare lamp is replaced to “NEW” (new or not-deteriorated lamp). Even if the spare lamp status is not “NEW”, you can erase the indication by resetting the spare lamp operating time (on page 77).



[Pre-announcement of auto-lamp changing]

The message appears when brightness deterioration is detected. The auto-lamp changing starts after 5-minute displaying.



2.2. Condenser lens adjustment (for **Single**)

When brightness is low after the lamp replacement, the brightness may increase if you adjust the position of the condenser lens.

You don't have to adjust it at initial setting since the position has been adjusted optimally with a built-in lamp at factory.

[Procedure]

1. After turning on the main power, wait until the brightness becomes stable (about three minutes).
2. To access the optical unit, open the screen (chapter 1.2.7.1, on page 21) in **Front** or open the rear panel in **Rear**.
3. Set WHITE BOOST OFF (chapter 1.5.3.9, on page 50).
4. Display an internal test pattern except "full-bit white" by [TEST] button.
5. Press and hold [DISPLAY] button in advanced mode to display the status information. The luminous sensor value (L.SENSOR) is indicated in the lowest line.

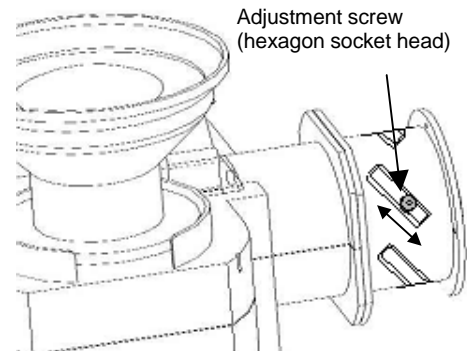
Luminous sensor value →

I ANALOG	ID01
F/W VER	P01.50A
H/W VER	12.19
SET TIMER	99999H
MASTER	
L.SENSOR	125

6. Loosen the adjustment screw on the optical unit with an Allen wrench (2.5mm).

7. Move the screw position along the flute to maximize the luminous sensor value and fix it.

Note: Do not tighten it with an excessive torque (suggested torque: $0.38\text{Nm}^{+/-0.03}$). Fix it not to move off the position.



8. Put back the WHITE BOOST setting.
9. Put back the screen (chapter 1.2.7.2, on page 22) or the rear panel.

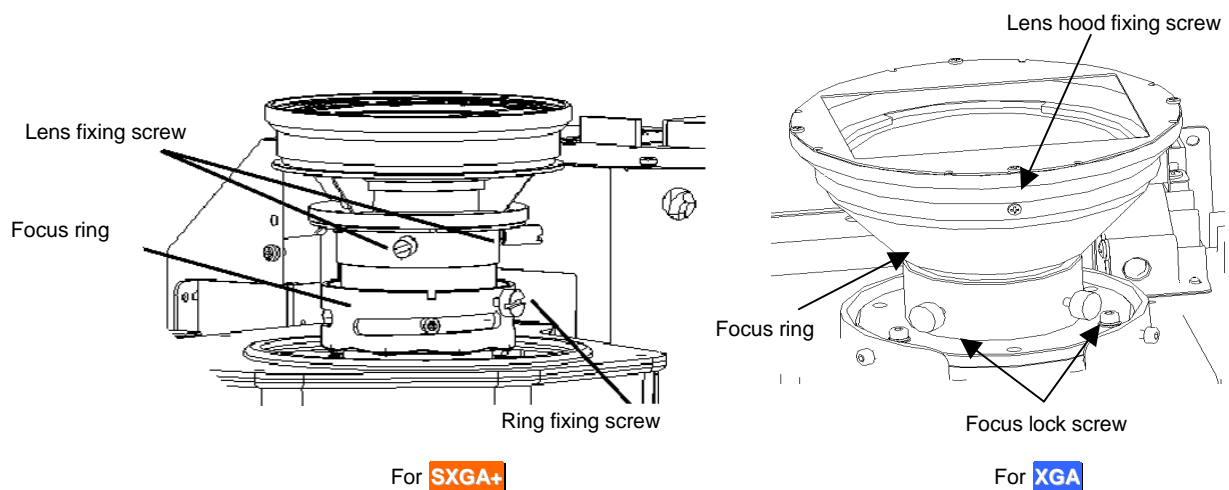
2.3. Focus adjustment

This adjustment is normally unnecessary.

You can adjust the lens focus when it is soft.

[Procedure]

1. Display the crosshatch pattern by pressing [TEST] button twice.
2. To access the optical unit, open the screen (chapter 1.2.7.1, on page 21) in **Front** or open the rear panels in **Rear**.
3. **XGA Rear**: Remove the band that fastens the accordion hose to the lens.
4. **XGA**: Loosen the lens hood fixing screw.
5. **XGA**: Loosen the two focus lock screws.
SXGA+: Loosen the two lens fixing screws and the ring fixing screw.



6. Turn the focus ring to focus on the center of the screen.
7. **XGA**: Turn the lens hood to align the position not to shade the image.
8. Turn the focus ring to adjust the focus with balance on the whole screen.
9. **XGA**: Turn the lens hood to align the position not to shade the image again.
10. Fix the focus lock screws (suggested torque: $0.38\text{Nm}^{+/-0.03}$). Be careful not to stress too much on the lens.
11. **XGA**: Fix the lens hood fixing screw (suggested torque: $0.15\text{Nm}^{+/-0.02}$).
12. **XGA Rear**: Put back the accordion hose and tighten the fixing band.
13. Put back the rear panels or the screen unit.

2.4. Cleaning

2.4.1. Screen front surface

Wipe with a lint free soft and dry cloth or with a damp cloth using water or alcohol. Do not use solvents including acid/alkali ingredients or abrasive. Do not scrub hardly with a dry hard cloth.

2.4.2. Cabinet

Wipe with a lint free soft and dry cloth, or with a damp cloth if necessary. Then add a finish the cleaning with a dry cloth.

Do not use solvents like thinner or benzene. It may cause degeneration or peeling off a coat.

2.4.3. Dust filter (for **Front**)

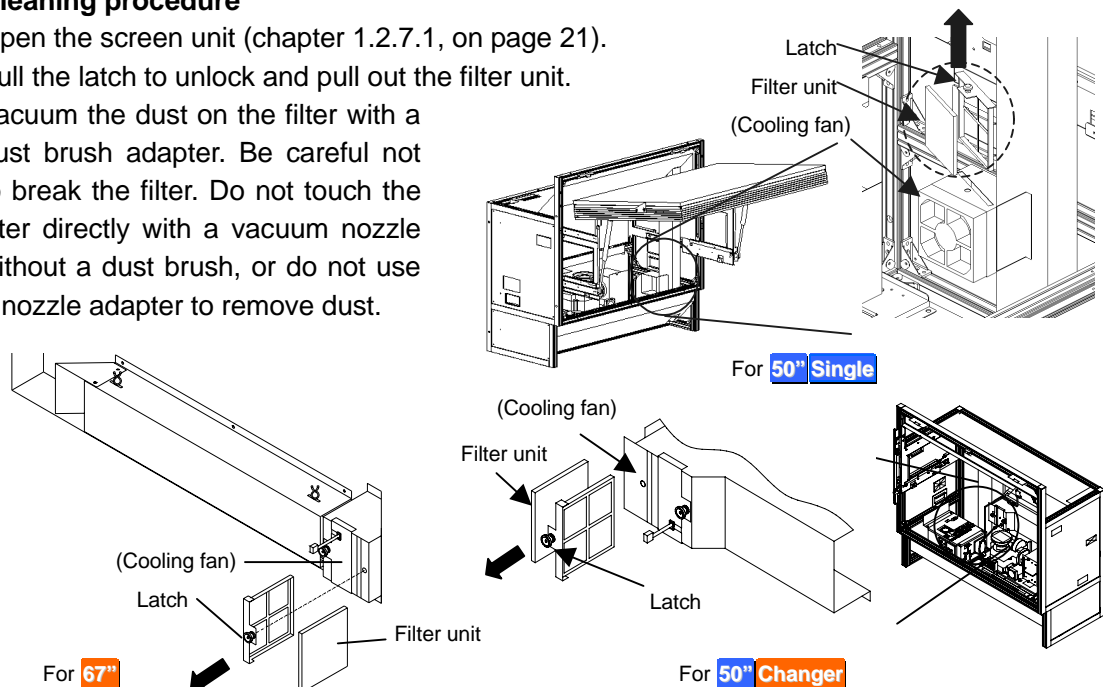
2.4.3.1. Warning indication

Front shows a warning indication to induce filter cleaning. Clean the filter when the warning indication appears on screen.

- **CHECK FILTER:** It appears when a designated time passes over. The initial setting is 4,000 hours. When external AC fans are equipped (chapter 0, on page 17), check its correct working as well as filter cleaning.
- **OVER TEMP (white):** It appears when internal temperatures become higher due to filter clogging or high ambient temperature. It is recommended to clean the filter. It can be erased by press-and-hold [ESC] button.
- **OVER TEMP (red with flashing):** It appears when the internal temperature is approaching serious high limit. It is highly recommended to turn off the product immediately for cooling down and to clean the filter.

2.4.3.2. Cleaning procedure

1. Open the screen unit (chapter 1.2.7.1, on page 21).
2. Pull the latch to unlock and pull out the filter unit.
3. Vacuum the dust on the filter with a dust brush adapter. Be careful not to break the filter. Do not touch the filter directly with a vacuum nozzle without a dust brush, or do not use a nozzle adapter to remove dust.



4. Put back the filter unit and close the screen unit (chapter 1.2.7.2, on page 22).
5. Reset the filter used hours with FILTER RESET menu.

2.4.3.3. FILTER RESET

You can reset filter used hours.

1. Select FILTER RESET in MAINTENANCE in the system menu.
2. Press [ENTER] button in reply to "RESET OK?" message.

2.4.3.4. FILTER TIME

You can designate the hours of interval to show "CHECK FILTER" message. The initial setting is 4,000 hours. If you set 0, the message will not be displayed.

1. Select FILTER TIME in INSTALLATION in the system menu.
2. Set the value to designate the hours of interval to display the warning message.

2.5. For delivery

Before shipment, be sure to fix the following locks. Shipping the product without locking may cause breakage.

2.5.1. 6-axis adjuster fixing

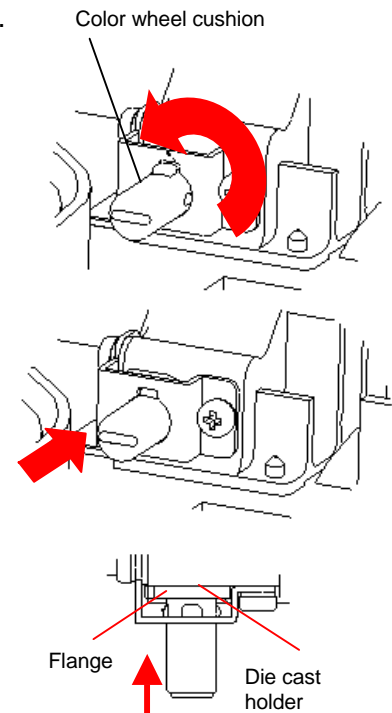
Fix the 5 fixing screws and 4 lock screws with referring to “1.4.3.2.5 Fixing the adjuster” on page 33.

2.5.2. Color wheel locking (for XL21)

The color wheel is located on the optical unit inside the cube.

1. Turn the color wheel cushion 90 degrees counter clockwise.
 - For **Changer**, pliers are recommended to use since it is hard to access with fingers.

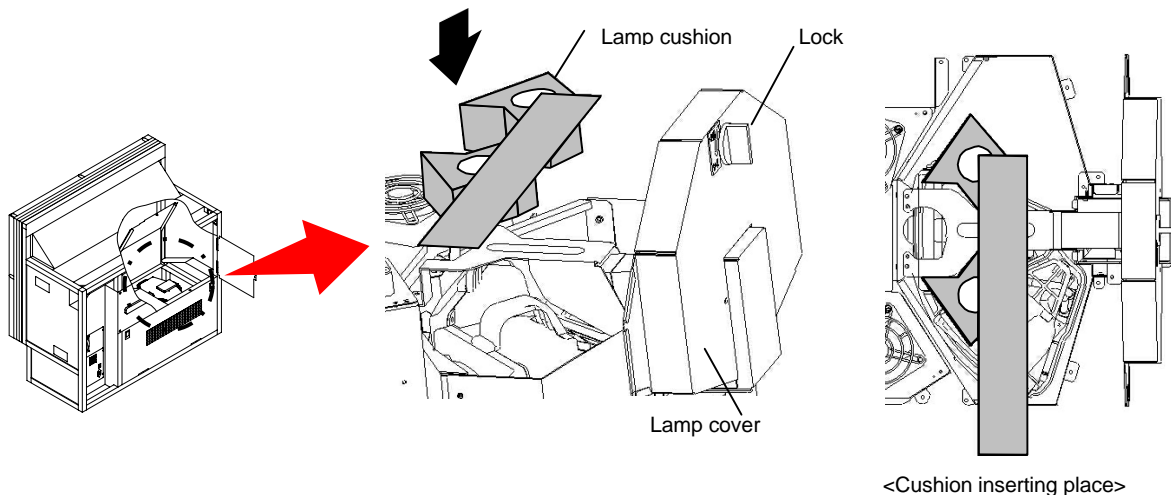
2. Push the color wheel cushion till the flange touches the die cast holder.



2.5.3. Lamp cushion inserting (for XL21 Changer)

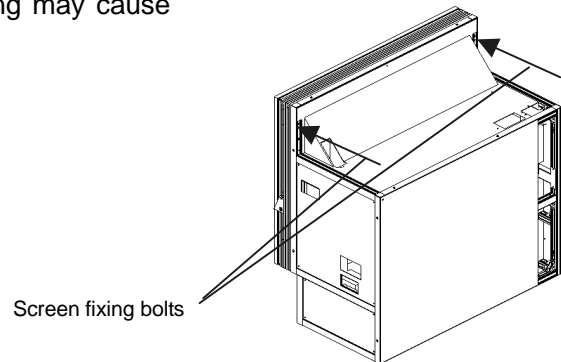
Before shipment, be sure to insert the lamp cushion into the designated place. Shipping the product without inserting may cause breakage.

- Be careful about the direction to insert the cushion.
- It should be remembered to lock the lamp cover after inserting. If you neglect to lock it, it may cause damage.



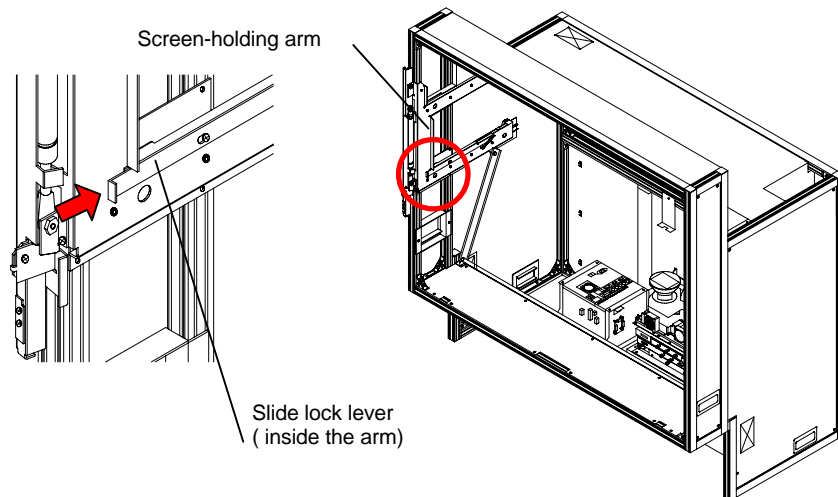
2.5.4. Screen-fixing bolt tightening (for 50" Front)

Before shipment, be sure to tighten the two screen-fixing bolts (M6 – 45mm, gold hexagon socket). Shipping the product without tightening may cause breakage.



2.5.5. Screen-holding arm locking (for 67" Front)

Before shipment, be sure to push the slide lock levers in order to lock the screen-holding arms. Shipping the product without locking may cause breakage.



3. Function

3.1. Memories

The memories are classified under 4 categories.

Memory	Description
Default memory	It is the preset memory and not adjustable. Available input signal list etc. corresponds to it. The automatic input signal scanning function scans the memories in order of the input memory and the default memory.
System memory	It stores all adjustment items except the input memory, the display memory and the default memory. It can be saved when you change values and exit the menu.
Input memory	It stores the settings of each input signal. The number of memories is 128. All items in the input memory menu are saved in the input memory. It can be called and deleted in INPUT MEMORY in [MEM LIST] menu.
Display memory	It stores the settings of each display pattern. The number of memories is 256. All items in the display memory menu are saved in the display memory. It can be called and deleted in DISPLAY MEMORY in [MEM LIST] menu.

3.2. Menu trees

This product has the following menus.

- Input memory menu: [MENU 1] button in the remote control
- Display memory menu: [MENU 2] button (short press) in the remote control
- System memory menu: [MENU 2] button (press-and-hold) in the remote control

3.2.1. Input memory

The input memory menu consists of “common items”, which are displayed for all signal inputs, and “additional items”, which are additionally displayed depending on the input signal.

In the following tables, the items within parentheses are initial values.

3.2.1.1. Common items

Item	Main input		Input board	Description	Page
	XL21	PH50 XL50			
H.POSITION	0 – 500	0 – 1000	0 – 1920	Input signal horizontal position setting	52, 58
V.POSITION	0 – 100	0 – 500	0 – 1200	Input signal vertical position setting	
H.SIZE	–	640 – 1400	600 – 2000	Input signal effective horizontal size setting	53, 59
V.SIZE	–	350 – 1050	350 – 1300	Input signal effective vertical size setting	
FRAME LOCK	–	ON, OFF (OFF)	ON, OFF (OFF)	Frame lock setting	53, 60
SCAN MODE	–		INTERLACE	Interlace signal setting	60
			F-INVERT	ODD/EVEN setting	
SIGNAL SELECT	640x480: 60Hz 800x600: 56Hz 800x600: 60Hz 1024x768: 60Hz 1280x960: 60Hz 1280x1024: 60Hz	–	AUTO NTSC PAL SECOM NTSC 4.43 PAL-M PAL-N PAL-60	Input signal selecting (when main input in XL21, COMPOSITE or Y/C input)	53, 60
CONTRAST	0 – 150 (100)			Contrast setting	55, 63
BRIGHTNESS	-50 – 50 (0)			Brightness setting	55, 63
COLOR MATRIX	OFF, VIDEO, COMPUTER, USER (OFF)			Color matrix setting	55, 63
APERTURE	OFF, 1, 2, 3, 4 (OFF)			Edge enhancement setting	55, 63
ASPECT-RATIO	–		4:3, 5:4, 16:9	Aspect ratio setting	64
SCALING FILTER	0, 1 (1)	0, 1, 2 (1)	0, 1, 2 (1)	Scaling filter setting	55, 64

3.2.1.2. Additional items (When ANALOG or S.ANALOG is selected)

Item	Main input		Input board	Description	Page
	XL21	PH50, XL50			
H.TOTAL	700 – 1900	700 – 2000	700 – 2640 (with B50KA) 700 – 2300 (with B20KA)	Sampling number setting	53, 61
FINE	-16 – 15 (0)		-32 – 31 (0)	Sampling phase setting	53, 58
CLAMP START	0 – 15 (0)	0 – 255 (0)	0 – 255 (0)	Clamp start position setting	54, 61
CLAMP WIDTH	0 – 15 (0)	0 – 30 (0)	0 – 30 (0)	Clamp width setting	
MASK START	–	-32 – 0 (-1)	-32 – 0 (-1)	Vertical sync mask start position setting	54, 61
MASK END	–	0 – 31 (1)	0 – 31 (1)	Vertical sync mask end position setting	
SYNC SELECT	AUTO, HD/VD, SOG			Sync signal selecting	54, 62
CLOCK RANGE	1 – 8	0 – 18	1 – 18 (with B50KA) 5 – 18 (with B20KA)	Sampling clock range setting	54, 62
AMP GAIN	AUTO GAIN MANUAL GAIN			Analog input gain setting	52, 59
SIGNAL-TYPE	–		RGB, YPbPr, YCbCr (with B50KA) RGB, YUV (with B20KA)	Analog signal type setting	62

3.2.1.3. Additional items (When S.DIGITAL is selected)

Item	Main input	Input board	Description	Page
SIGNAL-TYPE	–	RGB, YUV	Digital signal type setting	62

3.2.1.4. Additional items (When COMPOSITE or Y/C is selected)

Item	Main input	Input board	Description	Page
COLOR	–	-8 – 8 (0)	Color depth setting	64
TINT	–	-8 – 8 (0)	Hue of image setting	64
SHARPNESS	–	-8 – 8 (0)	Image sharpness setting	64
VCR MODE	–	– (with B50KV) ON, OFF (OFF) (with B20KV)	VCR mode setting	64

3.2.2. Display memory

In the following tables, the items within parentheses are initial values.

Item	Main input	Input board		Description	Page	
		XGA	SXGA+			
INPUT MEMORY	–	1 – 128.UNDEFINED		Referred input memory selecting	66	
H.DISPLAY POS	–	1/1 – 32/32 (1/1)		Horizontal expansion ratio setting	66	
V.DISPLAY POS	–	1/1 – 32/32 (1/1)		Vertical expansion ratio setting		
CROP	–	H.POSITION	0 – 1919 (0)		Crop adjustment	66
		V.POSITION	0 – 1199 (0)			
		H.SIZE	8 – 1020 (1024)	8 – 1920 (1400)		
		V.SIZE	1 – 1200 (768)	1 – 1200 (1050)		
DISPLAY	–	H.POSITION	-24 – 1023 (0)		Display adjustment	67
		V.POSITION	-17 – 767 (0)			
		H.SIZE	2 – 1072 (1024) (with B50KA) 1 – 1072 (1024) (with B20KA)	1 – 1448 (1400)		
		V.SIZE	2 – 802 (768) (with B50KA) 1 – 802 (768) (with B20KA)	1 – 1086 (1050)		
DIGITAL OUT	–	DISABLE, SCREEN, 1 – 128 (SCREEN)		Digital output setting	67	
SCREEN MODE	–	NORMAL, TRIMMING, FULL (NORMAL)		Referred aspect ratio setting	67	

3.2.3. System memory

The items within parentheses are initial values.

		Item		Description	Page	
MAINTENANCE	CSC	OFF, 1, 2 (OFF)		CSC adjustment	44	
	TARGET COLOR	SET TARGET COLOR		Color balance target setting	47	
	SENSOR	SENSOR	OFF, STOP, RUN (OFF)	Auto brightness correction setting	47	
		SET INITIAL SENSOR DATA				
	GRADATION (*4) WHITE, RED, GREEN, BLUE	TOP	-128 – 127 (0)		Gradation adjustment	46
		BOTTOM	-128 – 127 (0)			
		LEFT	-128 – 127 (0)			
		RIGHT	-128 – 127 (0)			
		TOP/LEFT	-128 – 127 (0)			
		TOP/RIGHT	-128 – 127 (0)			
		BOTTOM/LEFT	-128 – 127 (0)			
	LAMP CHANGE (Changer)	CALIBRATION		Lamp position auto calibration	43	
CHANGE MODE		OFF, NORMAL, LONG (NORMAL)	Auto-lamp change timing setting	43		
HOT EXCHANGE		FORBID, ALLOW (FORBID)	Hot lamp swap allowance setting	43		
MECH ALIGNMENT	ZOOM, H-KEYSTONE, V-KEYSTONE, TILT, H-POSITION, V-POSITION		Motorized 6-axis adjustment	31		
LAMP TIMER RESET				Lamp operating time resetting	73	
FILTER RESET (*3)				Filter used hours resetting	84	
INSTALLATION	BLACK LEVEL	R-LEVEL	0 – 127 (0)	Black level adjustment	44	
		G-LEVEL	0 – 127 (0)			
		B-LEVEL	0 – 127 (0)			
	WHITE BALANCE	LOW, MIDDLE, HIGH (MIDDLE)	R-GAIN	0 – 1000	White balance adjustment	45
			G-GAIN	0 – 1000		
			B-GAIN	0 – 1000		
	COLOR MATRIX: USER	RED	-20 – 20 (0)		Color matrix adjustment	48
		YELLOW	-20 – 20 (0)			
		GREEN	-20 – 20 (0)			
		CYAN	-20 – 20 (0)			
		BLUE	-20 – 20 (0)			
		MAGENTA	-20 – 20 (0)			
	AMP GAIN (In main input)	AUTO GAIN		Analog input gain setting	48	
		MANUAL GAIN				
SCALER AMP GAIN (*1)	AUTO GAIN		Analog input gain setting	49		
	MANUAL GAIN					
DIRECTION	FRONT, REAR		Access direction to inside	42		
FILTER TIME (*3)			0 – 30000 (4000)	Warning interval setting	84	
MISC FUNCTION	LAMP POWER	NORMAL, BRIGHT (NORMAL)		Lamp brightness setting	37	
	LAMP MODE (XL21)	LONG LIFE, NORMAL, F-REDUCTION (F-REDUCTION)		Lamp driving mode setting	37	

(Continued)

Item		Description	Page		
MISC FUNCTION	TERMINATE (In main input)	75, 1K (1K)	Termination setting	37	
	S.TERMINATE (*1)	75, 1K (1K)	Termination setting	37	
	ADV.COL	ON, OFF (ON)	Advanced color setting	49	
	ADV.DARK	ON, OFF (OFF)	Advanced dark setting	49	
	GAMMA	1 – 5 (1)	Gamma setting	49	
	DITHER	ON, OFF (ON)	Dither setting	49	
	3D Y/C (for video input board)	ON, OFF (ON)	3D Y/C setting	50	
	START MEMORY	OFF, 1 – 256 (OFF)	Display memory at start-up setting. In the case of OFF, it is last loaded memory.	38	
	OVERLAP (*1)	ON, OFF (OFF)	Overlap setting	38	
	OFFSET (*1)	H.POSITION	-16 – 16 (0)	Electrical image position fine adjustment	38
		V.POSITION	-16 – 16 (0)		
		H.SIZE	-16 – 16 (0)	Electrical image size fine adjustment	
		V.SIZE	-16 – 16 (0)		
	BAUD RATE	9600, 19200 (19200)	Transmission speed setting	39	
	SYSTEM SYNC	60, 50 (60)	50/60Hz mode setting	39	
	IMAGE FLIP	N/E, N/W, S/E, S/W (N/E)	Image flip setting	39	
	INDICATION	WARNING (Changer)	MESSAGE ☀;☀, OFF (MESSAGE ☀)	Message indication setting	40
		STANDBY	LED, OFF (LED)		
		ERROR	LED, OFF (LED)		
		BLOWOUT (*2)	LED, OFF (LED)		
WHITE BOOST	OFF, 1 – 10 (OFF)	White boost setting	50		
AUTO POWER ON	ON, OFF (OFF)	Auto power on setting	41		
BLOWOUT (*2)	OPERATE, SHUTDOWN (OPERATE)	Lamp blowout mode setting	41		
EXTENDED ID	NORMAL, ID:33–64 (NORMAL)	ID setting mode	41		
CABLE LENGTH (PH50 and XL50)	DIGITAL S.DIGITAL (with B50KA)	NORMAL, LONG, CUSTOM (NORMAL)	Digital cable length setting	42	
RESOLUTION (PH50)	SXGA, SXGA+ (SXGA+)	Resolution setting	42		

(*1) This menu is displayed when the input board is attached and it can be selected when a port in the input board is selected.

(*2) This menu is displayed in **XL21** or when the input board is attached in **PH50** and **XL50**.

(*3) This menu is displayed in **Front** or when DIRECTION menu is set FRONT.

(*4) Each WHITE, RED, GREEN and BLUE in GRADATION has the same adjustment items.

3.2.4. Memory list display

[MEM LIST] button displays the input or display memory list to call or delete registered memories. DISPLAY MEMORY menu can be displayed and selected when the input board is attached.

Item		Description	Page
MEMORY CALL	INPUT MEMORY	INPUT MEMORY	56, 65
		DELETE MEMORY	
	DISPLAY MEMORY	DISPLAY MEMORY	68
		DELETE MEMORY	

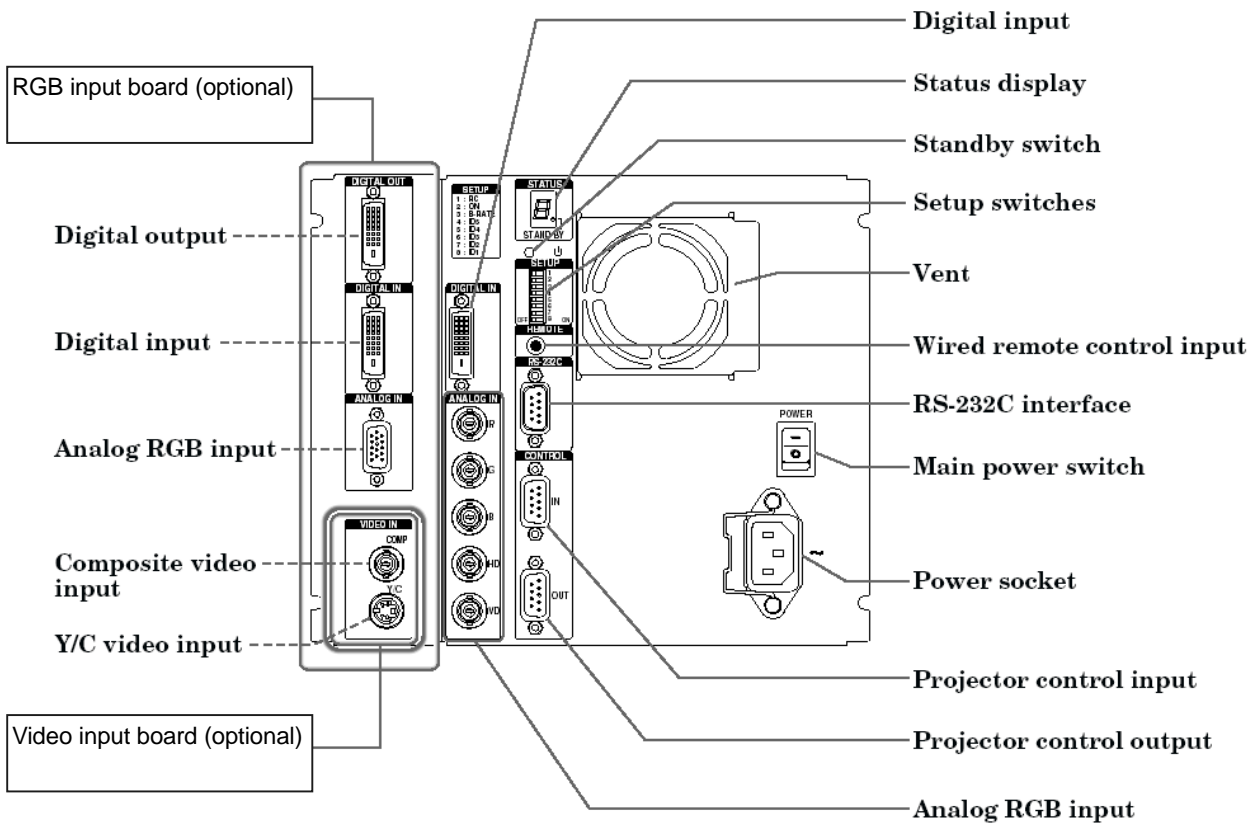
3.3. Test pattern list

Pressing [TEST] button rounds the test patterns to be displayed in the following order.

Full-bit white – Crosshatch – Adjustment white – Gradation – Color bar – Test pattern OFF – (Full-bit white)

Pattern	Description	Case of use
Full-bit white	Any picture adjustments except gamma compensation are invalid. All RGB-GAIN values in BLACK LEVEL become 0 at full black. [R], [G] and [B] buttons can turn ON/OFF each color.	
Crosshatch	[R], [G] and [B] buttons can turn ON/OFF each color.	Total adjusting for display wall
Adjustment white	[R], [G] and [B] buttons can turn ON/OFF each color.	CSC adjustment GRADATION adjustment
Gradation	All picture adjustments are invalid.	
Color bar		CSC adjustment

3.4. Control panel



3.5. LED display
























This product indicates current status on the error indicator in the control panel and with "Warning LED" which lights blue on the screen.

- Warning LED indication can be set in INDICATION menu (chapter 1.5.1.11, on page 40). You can erase the indication by [ESC] button while LED lighting. [DISPLAY] button can restore the setting. This LED off setting is effective until the main power switch is turned off.
- A lamp operating time is shown on the error indicator with 5-digit blinking figure by pressing [DISPLAY] button while power on or stand-by state.



Warning LED
(Blue light on screen)

LED display list

Status	Warning LED	Error indicator	Reading	Memo												
System initializing	Off		8.													
Stand-by state	On		. (Dot)	After automatic shutdown, the last error indication is retained in stand-by state.												
Start-up processing	Off		12345 (Count-up)	It counts up according to the process. Error status is cleared and re-checked.												
In-service (normal state)			(None)													
No signal			- (Bar at center)													
Shutdown processing			. (Dot)													
No lamp or incorrect attachment (Single) Lamp cover open (Changer)	Light on 1 sec. off 1 sec.		4.	The failure detection immediately shuts it down to go to stand-by state.												
Lamp ignition failure or lamp burnout			1.	The error indicator blinks while retrying. It automatically enters the lamp blowout mode.												
Lamp incorrect attachment or lamp power failure (PH50 and XL50 Changer)		    	1. + a number	The failure detection immediately shuts it down to go to stand-by state. "1." and a number alternately appear to specify the failure. <table border="1" data-bbox="1002 972 1449 1151"> <thead> <tr> <th>No.</th> <th>Failure</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Either lamp is incorrect</td> </tr> <tr> <td>3</td> <td>Both lamps are not attached</td> </tr> <tr> <td>4</td> <td>Unmatched lamp with power circuit</td> </tr> <tr> <td>5</td> <td>Failure of power circuit for Lamp A</td> </tr> <tr> <td>6</td> <td>Failure of power circuit for Lamp B</td> </tr> </tbody> </table>	No.	Failure	2	Either lamp is incorrect	3	Both lamps are not attached	4	Unmatched lamp with power circuit	5	Failure of power circuit for Lamp A	6	Failure of power circuit for Lamp B
No.	Failure															
2	Either lamp is incorrect															
3	Both lamps are not attached															
4	Unmatched lamp with power circuit															
5	Failure of power circuit for Lamp A															
6	Failure of power circuit for Lamp B															
Fan failure	Light on 1 sec. off 5 sec.	    	0. (Zero) + a number	During shutdown process, "0." and a number alternately appear to specify the defective fan. One minute after the failure detection, it automatically turns off and retries to turn on once. Then it enters stand-by state. <table border="1" data-bbox="1002 1317 1449 1496"> <thead> <tr> <th>No.</th> <th>Defective fan</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Chassis cooling fan</td> </tr> <tr> <td>2</td> <td>Cube cooling fan (for XGA)</td> </tr> <tr> <td>3</td> <td>DMD chip cooling fan</td> </tr> <tr> <td>4</td> <td>Lamp cooling fan</td> </tr> <tr> <td>5</td> <td>Lamp power cooling fan</td> </tr> </tbody> </table>	No.	Defective fan	1	Chassis cooling fan	2	Cube cooling fan (for XGA)	3	DMD chip cooling fan	4	Lamp cooling fan	5	Lamp power cooling fan
No.		Defective fan														
1		Chassis cooling fan														
2		Cube cooling fan (for XGA)														
3		DMD chip cooling fan														
4		Lamp cooling fan														
5	Lamp power cooling fan															
Lamp changer circuit failure (Changer)		9.	When the failure is detected, it automatically turns off after cooling down, and retries to turn on once. Then it enters stand-by state.													
Formatter circuit failure		2.														
Power failure		7.														
Color wheel failure Lamp changer mechanical failure (Changer)	Light on 5 sec. off 1 sec.		5.	One minute after the failure detection, it automatically turns off and retries to turn on once. Then it enters stand-by state.												
Firmware writing	Off		(None)													

* The real error number shows continuously. Ignore numbers that appear only briefly.

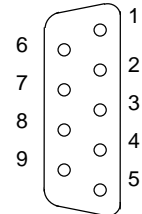
* An error code may not indicate the primary cause. It may detect a secondary failure.

3.6. Terminal functions

3.6.1. RS-232C terminal

- Connector: D-sub 9 pins male
- Cable: Commercially available cross cables can be used to connect with an external controller.
- Pin assignment:

Pin No.	I/O	Signal
1	–	N.C.
2	Input	RD (Receive Data)
3	Output	SD (Send Data)
4	Output	ER (Equipment Ready)
5	–	SG (Signal Ground)
6	Input	DR (Data Set Ready)
7	–	N.C.
8	–	N.C.
9	–	N.C.

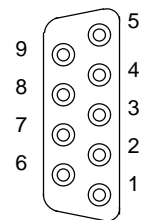


RS-232C port

3.6.2. CONTROL terminal

- Connector: D-sub 9 pins female (both IN and OUT)
- Cable: Supplied control cables (male – male) should be used to connect between cubes.
- Pin assignment:

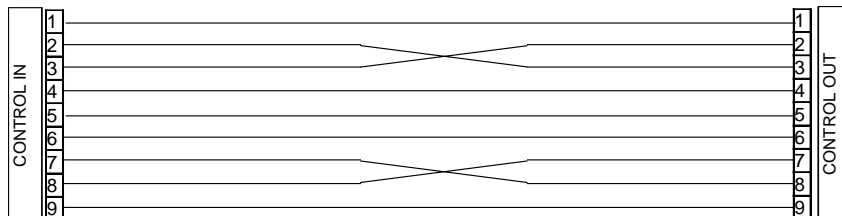
Pin No.	I/O		Signal	
	IN	OUT	IN	OUT
1	Input	Output	EXVIN	EXVOUT
2	Output	Output	TXDS2	TXDM2
3	Input	Input	RXDS2	RXDM2
4	Output	Input	GND	GND
5	Input/output	Input/output	UP/BUSY	UP/BUSY
6	Input	Output	RCIN	RCOUT
7	Output	Output	TXDS2	TXDM2
8	Input	Input	RXDS2	RXDM2
9	Output	NC	DE1	NC



CONTROL IN/OUT port

Note: The pin assignment is different from conventional models (FD series).

- CONTROL cable connection diagram



3.7. Available input signal list

RGB signal

Computer/ signal	Resolution	Line rate (kHz)	Frame rate (Hz)	PH50, XL50			XL21	
				Main input	with B50KA	PH50 with B20KA	Main input	with B20KA
IBM PC/AT compatible	640 x 400	31.5	70.1	O	O	O	–	O
	640 x 400	37.9	84.1	O	O	–	–	O
	640 x 400	37.9	85.1	O	O	–	–	O
	640 x 480 ^{*2}	31.5	59.9	O	O	O	O	O
	640 x 480	37.9	72.8	O	O	O	–	O
	640 x 480	37.5	75.0	O	O	O	–	O
	640 x 480	43.3	85.0	O	O	–	–	O
	800 x 600	35.2	56.3	O	O	O	O	O
	800 x 600	37.9	60.3	O	O	O	O	O
	800 x 600	48.1	72.2	O	O	O	–	O
	800 x 600	46.9	75.0	O	O	O	–	O
	800 x 600	53.7	85.1	O	O	–	–	O
	1024 x 768	48.4	60.0	O	O	O	O	O
	1024 x 768	56.5	70.1	O	O	O	–	O
	1024 x 768	60.0	75.0	O	O	O	–	O
	1024 x 768	68.7	85.0	O	O	–	–	O
	1152 x 864	63.9	70.0	O	O	O	–	O
	1152 x 864	67.5	75.0	O	O	O	–	O
	1152 x 864	77.5	85.1	O	O	–	–	O
	1280 x 960	60.0	60.0	O	O	O	O	O
	1280 x 960	75.0	75.0	–	O	O	–	O
	1280 x 1024	64.6	59.9	O	O	O	O	O
	1280 x 1024	63.4	60.0	O	O	O	O	O
	1280 x 1024	64.0	60.0	O	O	O	O	O
	1280 x 1024	75.1	71.2	–	O	O	–	O
	1280 x 1024	80.0	75.0	–	O	O	–	O
	1280 x 1024	91.1	85.0	–	O	–	–	O
	1400 x 1050	64.7	59.9	O	O	O	–	O
1400 x 1050	65.3	60.0	O	O	O	–	O	
1400 x 1050	64.0	60.0	O	O	O	–	O	
1400 x 1050	82.3	74.9	–	O	O	–	O	
1600 x 1200	75.0	60.0	–	O	O	–	O	
Apple Macintosh	640 x 480	35.0	66.7	O	O	O	–	O
	832 x 624	49.7	74.5	O	O	O	–	O
	1024 x 768	60.2	74.9	O	O	O	–	O
	1152 x 870	68.6	75.0	O	O	O	–	O
1280 x 1024	81.1	76.1	–	O	–	–	O	
Sun	1280 x 1024	71.7	66.7	O	O	O	–	O
	1280 x 1024	81.1	76.1	–	O	–	–	O
SGI	1280 x 1024	76.9	72.3	–	O	O	–	O
	1280 x 1024	82.0	76.0	–	O	–	–	O
HP	1280 x 1024	78.1	72.0	–	O	O	–	O
HDTV (16:9) ^{*1}	1280 x 720 ^{*4}	37.5	50.0	–	O	–	–	–
	1280 x 720 ^{*4}	45.0	59.9	–	O	–	–	–
	1920 x 1080 ^{*4 *5}	28.1	50.0	–	O	–	–	–
	1920 x 1080 ^{*4 *5}	33.7	59.9	–	O	O	–	O

Y_CB_CR (Y_PB_PR) component video signal

Computer/ signal	Resolution	Line rate (kHz)	Frame rate (Hz)	PH50, XL50			XL21	
				Main input	with B50KA	PH50 with B20KA	Main input	with B20KA
1125i / 1080i (16:9) *1	1920 x 1080 *4 *5	28.1	50.0	–	O	–	–	–
	1920 x 1080 *4 *5	33.7	59.9	–	O	O *3	–	O *3
750p / 720p (16:9) *1	1280 x 720 *4 *5	37.5	50.0	–	O	–	–	–
	1280 x 720 *4 *5	45.0	59.9	–	O	O	–	O
625p / 576p (4:3)	720 x 576 *4 *5	31.3	50.0	–	O	O	–	O
525p / 480p (4:3) *2	720 x 480 *4 *5	31.5	59.9	–	O	O	–	O

Note:

- With VC-B20KA, the front porch width in an input signal is required more than 12 pixels.
- Because the following pairs of signals have the same scanning frequencies, their signal formats may be selected incorrectly in automatic input signal scanning. When the selected signal format is wrong, the signal won't be displayed with correct colors. In such cases, executes automatic input signal scanning (chapter 1.7.3, on page 57) again to reselect other signal formats.
 - *1: HDTV (16:9) format in RGB signal and 1080i or 720p (16:9) format in Y_CB_CR (Y_PB_PR) signal
 - *2: 640x480 /60 Hz in RGB signal and 480p (4:3) format in Y_CB_CR (Y_PB_PR) signal
- The following signals are processed as follows:
 - *3: The signal undergoes under sampling at the specified resolution.
 - *4: The signal is displayed with over scan.
 - *5: This signal isn't supported when it is supplied to the DIGITAL IN connector.

3.8. Motorized adjustment tool, S-AXL50E specification

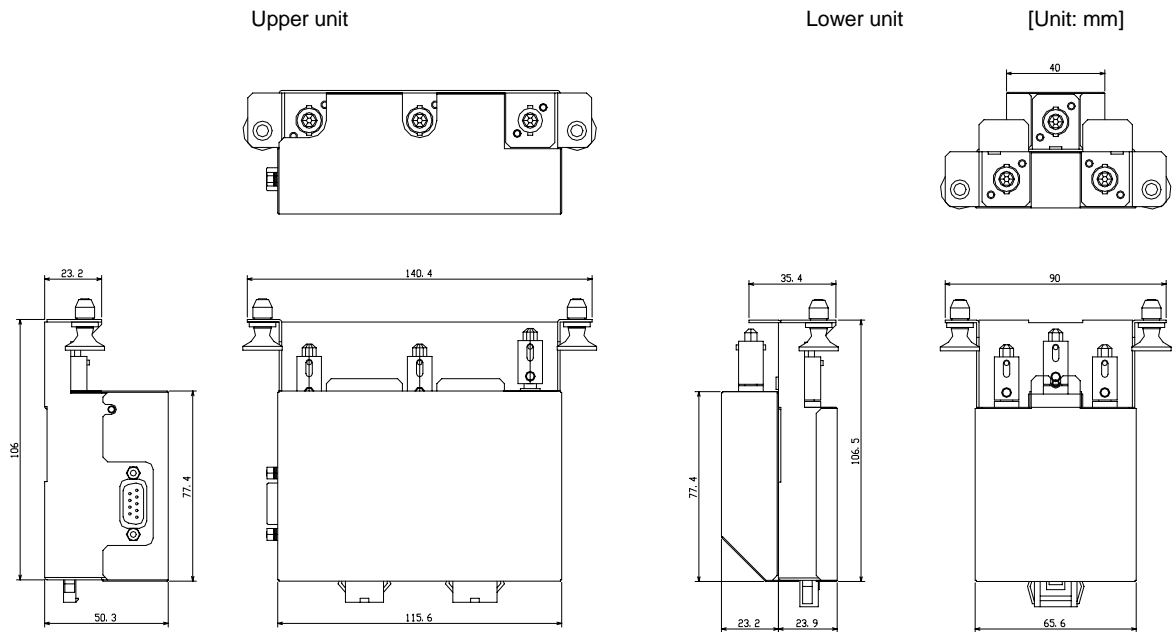
The detail adjustment procedure is described in the chapter 1.4.3.2.2, on page 29.

3.8.1. Applicable product

This tool can be used for the following models.

- All **PH50** and **XL50** series
- VS-50XLF20U, VS-67XLW20U, VS-50XL21U and VS-67XL21U
- VS-67XL20U (applied from serial number 0001176)
- VS-50XLW20U (applied from serial number 0001121)

3.8.2. Outline drawing



3.8.3. Accessory

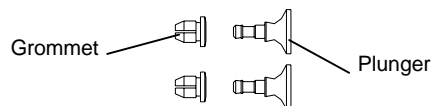
1. Unit-connecting cable (shorter) 3 pieces (two cables are spares.)



2. Cube-connecting cable (longer) 3 pieces (two cables are spares.)

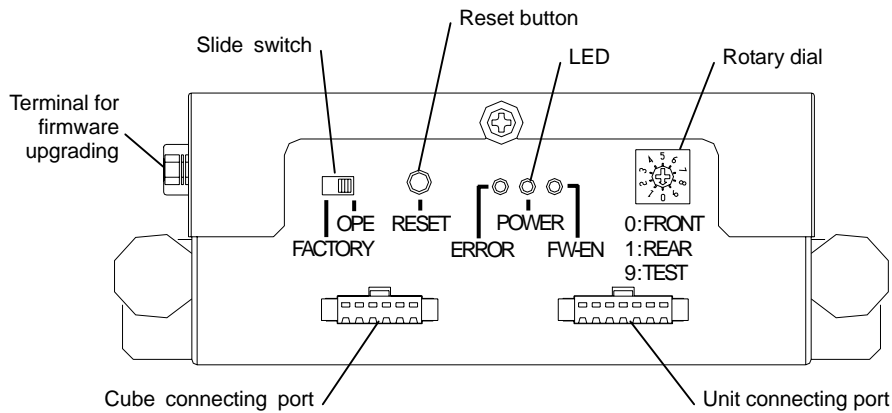


3. Spare latch 2 pieces (consisting of grommets and plungers)



3.8.4. Terminals

3.8.4.1. Outline



3.8.4.2. Rotary dial

Used to set to suit the cube configuration.

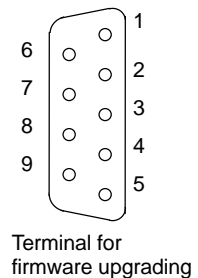
No.	Name	Reflection	Access type	Applicable product
0	FRONT	One-time reflection	Front	Front
1	REAR	One-time reflection	Rear	Rear
2	D-FRONT	Direct displaying	Front	
3	D-REAR	Direct displaying	Rear	
4	(reserved)			
5	(reserved)			
6	(reserved)			
7	(reserved)			
8	(reserved)			
9	TEST			

3.8.4.3. Terminal for firmware upgrading/slide switch

Used to upgrade the firmware of the unit. Set the slide switch FACTORY (left side) when upgrading.

- Terminal: D-sub 9 pins (male)
- Cable: Commercially available RS-232 cross cables can be used to connect with a PC.
- Pin assignment:

Pin No.	I/O	Signal
1	–	N.C.
2	Input	RD (Receive Data)
3	Output	SD (Send Data)
4	Output	ER (Equipment Ready)
5	–	SG (Signal Ground)
6	Input	DR (Data Set Ready)
7	–	N.C.
8	–	N.C.
9	–	N.C.



3.8.4.4. LED

- ERROR (red): It lights when an over current is detected due to the axis locking. The unit cannot be operated until resetting.
- POWER (green): It lights when 12-volt power is supplied to the unit.
- FW-EN (yellow): It lights when the slide switch is set FACTORY for firmware upgrading.

3.8.4.5. Reset button

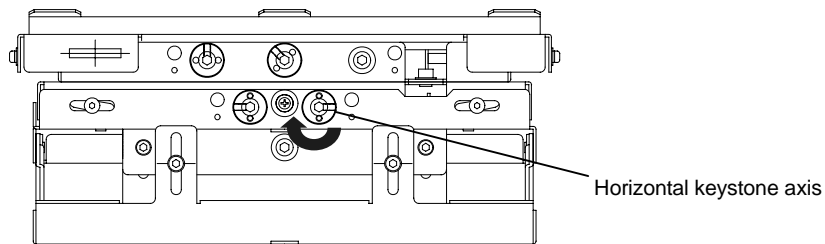
Used to reset an error indication when red LED lights. The LED will turn off if it recovers from the error.

3.8.5. Recovery procedure from error

When an adjusting axis is locked, the red LED lights and the unit cannot be operated. Solve the error according to the following procedure.

1. Detach the upper and lower units from the adjuster.
2. Turn back the locked axis to release with an Allen wrench (5mm) since it reaches the end of the adjustment range.

For instance, when the horizontal keystone is locked on the right end of screen in **Front**, detach the units and turn the axis clockwise to release.



3. Push the reset button with an acuminate tool such as a pen point to turn off the red LED.
4. Re-attach the units on the adjuster.

3.8.6. Trouble shooting

Problems	Remedies
The latch is broken.	<ul style="list-style-type: none"> • Replace the broken latch with a spare. Note: When replacing, the first step is to attach the grommet on the unit. Then insert the plunger into it. You cannot attach the latch in the state of integrated.
The motor doesn't spin.	<ul style="list-style-type: none"> • Replace the connecting cable with a spare. The wire may be broken. • Check the yellow LED, which indicates the FACTORY mode. If the LED lights, set the slide switch OPE side and push the reset button.
Green LED doesn't light.	<ul style="list-style-type: none"> • Check the cable connecting. When the LED doesn't light even if it connects correctly, replace the connecting cable with a spare. The wire may be broken.
The red LED lights.	<ul style="list-style-type: none"> • Release the locked axis according to the chapter 3.8.5.
MECH ALIGNMENT menu on screen cannot be selected.	<ul style="list-style-type: none"> • Check the yellow LED, which indicates the FACTORY mode. If the LED lights, set the slide switch OPE side and push the reset button of the unit. After resetting, exit the on-screen menu once, and re-enter the menu.

4. Adjustment software, “Wallaby”

4.1. General

“Wallaby” is a software program that can adjust a display wall through RS-232 format communication. Up to 64 cubes in a display wall can be controlled separately according to the allocated ID numbers.

This software works with Microsoft® Windows® 95, Windows 98, Windows Me, Windows NT® Version4.0, Windows 2000 and Windows XP. It is recommended to use Windows NT Version4.0, Windows 2000 or later.

4.2. Installation

4.2.1. Software Installation

1. Insert the set-up disk or copy the set-up files into a control PC and double-click the Setup.exe.
2. Follow its installation messages until finish.

4.2.2. Connecting

Connect the Wallaby-installed PC to the master cube with a commercially available RS-232 cross cable. Make sure that each cube in the display wall is connected with supplied control cables. (Refer to chapter1.3, on page 23.)

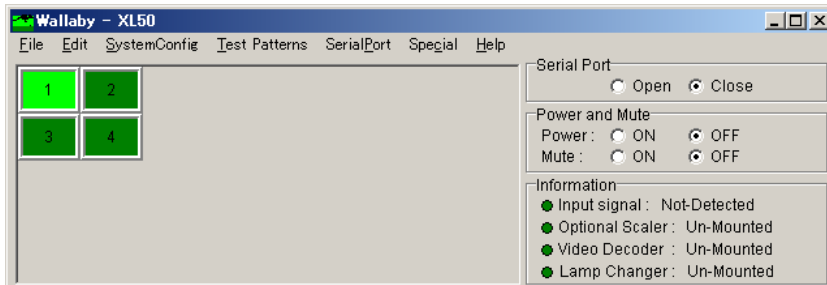
4.2.3. Dipswitch setting

Make sure that the dipswitches of the cubes are set correctly. (chapter 1.4.2, on page 28.)

4.2.4. Starting the application

Execute the “Wallaby” for suitable models in Windows® start menu.

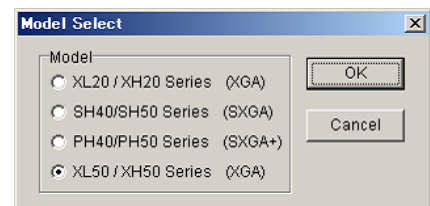
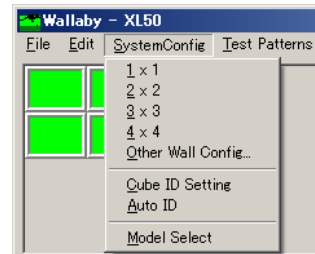
4.3. Initial set-up



Main window

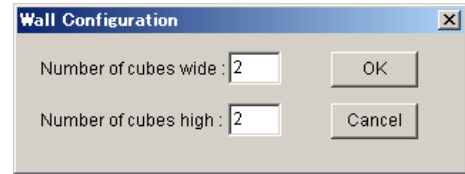
4.3.1. Model selecting

Click “Model Select” in “System Config” menu to select suitable model range to be controlled. When you execute the application from the appropriate Windows® start menu, this operation is not necessary.



4.3.2. System configuration setting

1. Click "Other Wall Config" in "System Config" menu. The "Wall Configuration" window comes up.
2. Set horizontal and vertical cube numbers and click "OK" button to confirm. The designated number of panels appears on main window and the "Wall Configuration" window closes.

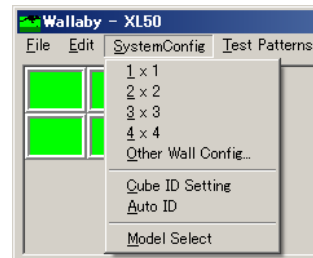


Note: Wallaby starts with the last system configuration. This operation is not necessary when the configuration you are setting is the same as the previous adjustment.

4.3.3. Panel ID defining

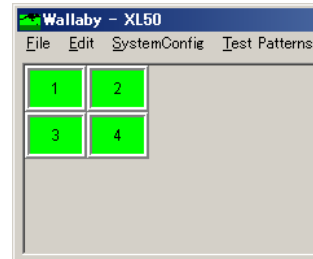
Define panel IDs in accordance with the set ID designated by the dipswitch.

Note: Wallaby starts with the last system configuration. This operation is not necessary when the configuration you are setting is the same as the previous adjustment.



4.3.3.1. Automatic panel ID setting

1. Select panels to be defined the panel IDs.
2. Click "Auto ID" in "System Config" menu. Available numbers are automatically allocated in a sequential order from upper left panel regardless of dipswitch setting. Make sure the dipswitch is adequately set so as to match with the panel ID setting.



4.3.3.2. Manual panel ID setting

You can also set the panel IDs by manual.

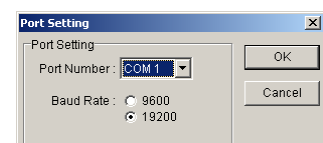
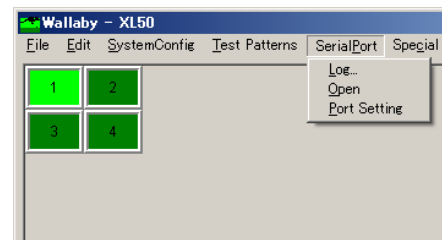
1. Click "Cube ID Setting" in "System Config" menu. "Cube ID" window comes up.
2. Select a panel to be defined the panel ID in the main window and input (or select) the number in the list box in "Cube ID" window.
3. Define other panel IDs in the same way.
4. Close the window after all panel ID definition.



4.3.4. Serial port setting

The Wallaby-installed PC can communicate with cubes through a serial port. The PC is required port setting and opening to communicate.

1. Click "Port Setting" in "Serial Port" menu. "Port Setting" window comes up.
2. Set the serial port number and the communication speed and click "OK" button to confirm. The communication speed should be set according to the baud rate setting in cubes.

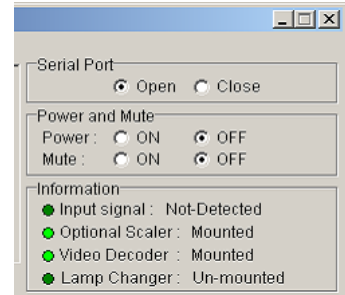


Note: Wallaby starts with the last system configuration. This operation is not necessary when the configuration you are setting is the same as the previous adjustment.

4.3.5. Serial port opening

Check “Open” in “Serial Port” in the main window or in the menu bar to open the port. The communication with cubes is automatically detected and non-communicable panels become gray.

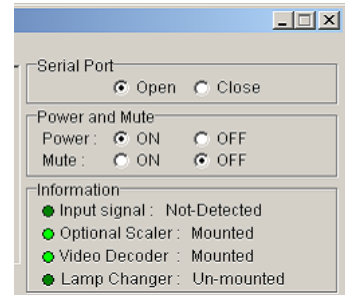
Note: When you use the port for any other applications, Wallaby should close the port.



4.3.6. Turning on

Data transmission or reading is not allowed during cube standby state. Turn on the cubes before these operations.

1. Select panels to turn on.
2. Check “ON” in “Power” in “Power and Mute” in the main window to turn on the cubes. To turn off (go back to stand-by state), check “OFF”.



4.3.7. Picture mute off

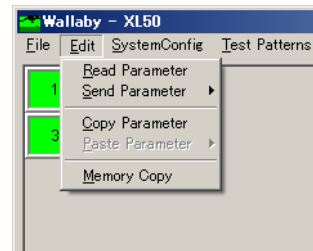
You can cancel the picture mute of cubes to display images. Even if you set the picture mute off, no image is displayed with no signal input.

1. Select panels to control.
2. Check “OFF” in “Mute” in “Power and Mute” in the main window.

4.3.8. Data reading

Just after starting up the software, the data in the software may not synchronize with actual cube data. In this case, read the cube data to update the data in the software.

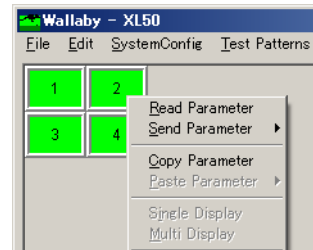
1. Select panels to read data.
2. Click “Read parameter” in “Edit” menu to read the data.



Or you can also read them by right-click on panels.

1. Select panels to read data.
2. Right-click the active panels to select “Read Parameter” in the right-click menu.

Note: Data readings may take a while. Necessary time is in proportion to the number of active panels.



4.4. Adjustment

Set items in Service tab (chapter 4.4.1, on page 102), Input tab (chapter 4.4.2, on page 106), and Display tab (chapter 4.4.3, on page 109). The setting is stored in a nonvolatile memory in each cube.

- The software can control and adjust cubes regardless of their operation mode (chapter 1.4.1.2, on page 26).
- When you exit each tab after the adjustment, click “Save” button surely to save the setting in the nonvolatile memory in each cube. This operation is not necessary when it has already been stored or it is not changed.
- In the following description, the Wallaby menus are explained in contrast with the remote control operation. Any menus are not displayed on screen by Wallaby operation.

4.4.1. Service tab (for system memory)

Service tab can be protected by a password. You can change or invalidate the password in “Special” menu (chapter 4.7.6 on page 117).

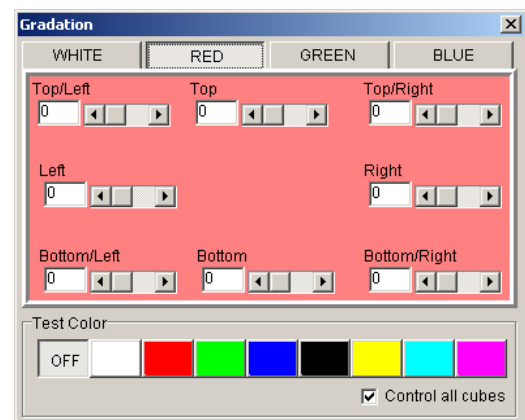
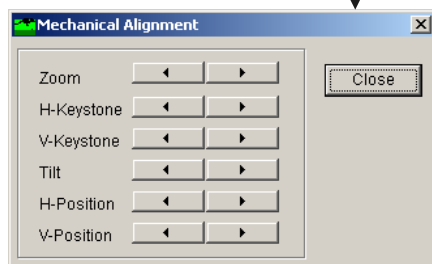
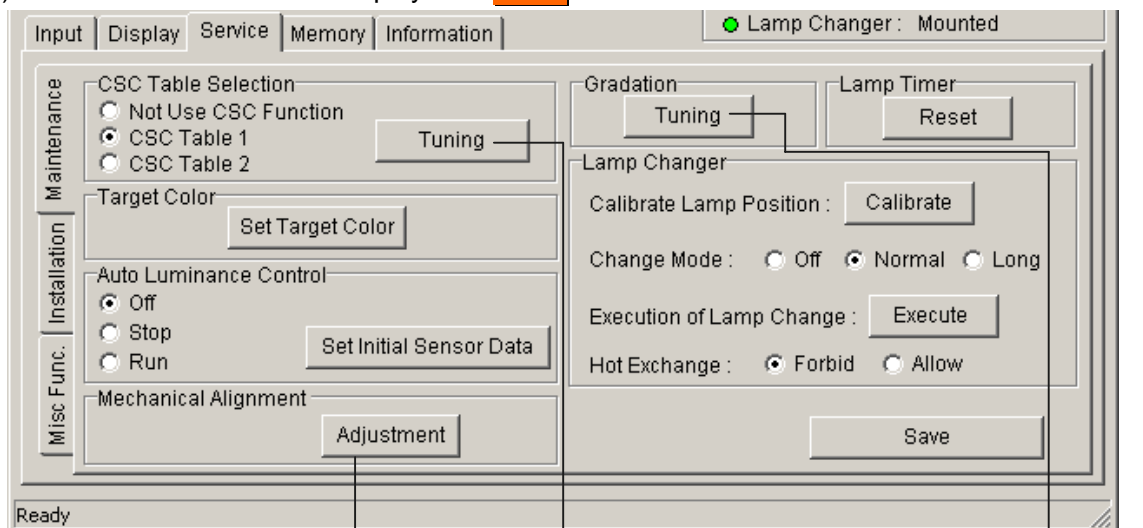
When you exit the tab, click “Save” button surely to store the setting in each cube.

4.4.1.1. MAINTENANCE

With remote control		Wallaby menu	Page
CSC		“CSC Table Selection”	44
TARGET COLOR		“Target Color”	47
SENSOR		“Auto Luminance Control”	47
GRADATION		“Gradation”	46
LAMP CHANGE	CALIBRATION	“Calibrate Lamp Position” in “Lamp Changer” (*a)	43
	CHANGE MODE	“Change Mode” in “Lamp Changer” (*a)	43
	HOT EXCHANGE	“Hot Exchange” (*a)	43
MECH ALIGNMENT		“Mechanical Alignment”	31
LAMP TIMER RESET		“Lamp Timer”	73
FILTER RESET		In Information tab (on page 110) (*b)	84
Manual lamp swap ([INPUT B] + [ESC] + [2-digit ID number])		“Execution of Lamp Change” in “Lamp Changer” (*a)	79

(*a) The item with this mark is displayed in **Changer**.

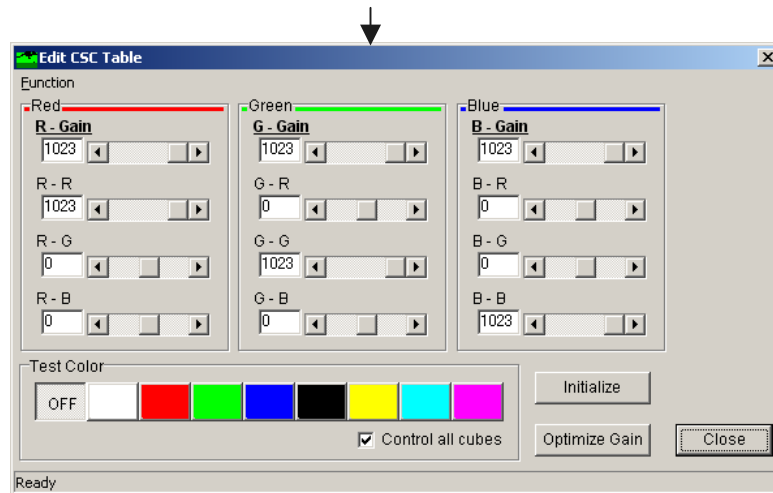
(*b) The item with this mark is displayed in **Front** or when DIRECTION menu is set FRONT.



(Next page)

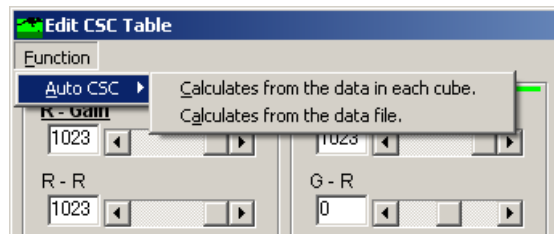
(Continued)

CSC Table Selection



Auto CSC function

Wallaby can automatically calculate the optimum CSC values from color data which cubes originally retains or measured with a color analyzer.



1. In “Auto CSC” menu in “Function” in “Edit CSC Table” window, select “Calculates from the data in each cube”.
2. Wallaby automatically calculates the optimum CSC values and send them to cubes. The calculated CSC values reflect on your selected CSC table 1 or 2.
3. After the automatic adjustment, you can put a finish on insufficient areas by manual (on page 45).

When you select “Calculates from the data file” in the step 1, the file-selecting window appears. Designate a .csv file, which was created with the color analyzer control software. The calculated CSC values are sent back to cubes in the order of panel IDs. Be sure the color data was measured in this order.

Note:

The brightness/color data in each cube is measured at factory. The color balance may not match with Auto CSC function in the following cases. Adjust it by manual (on page 45) or with a color analyzer (on page 44).

- Auto CSC adjustment after long lamp use or lamp replacement.
- With different types of screens from Mitsubishi specified standard screen.
- **Changer** lighting with lamp B. The color data was measured with lamp A.
- When “Data is invalid or nothing” message appears in the software.

Optimize gain function

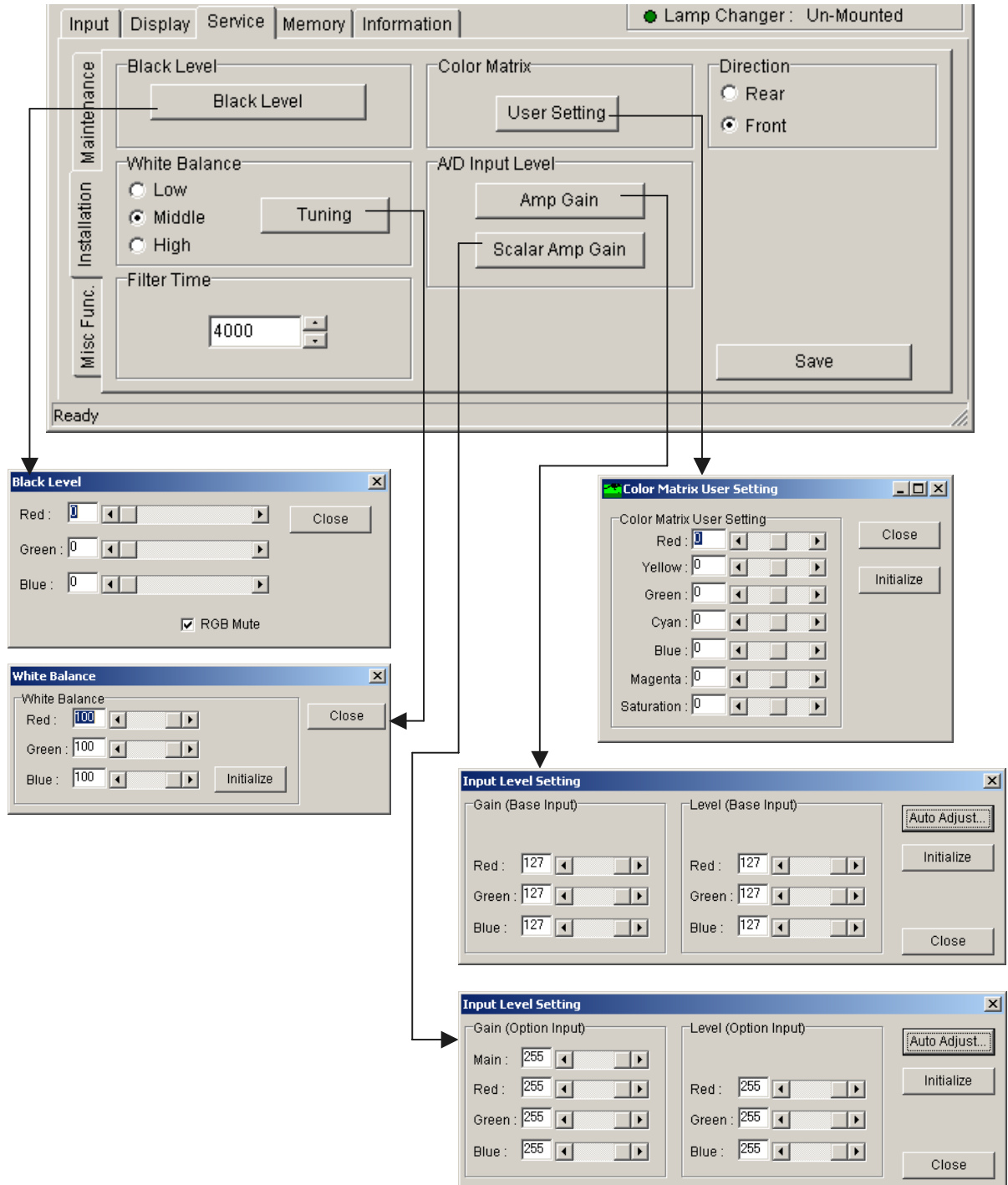
This adjustment is normally unnecessary since Auto CSC (described above) and SENSOR functions (chapter 1.5.2.7, on page 47) include the same function.

“Optimize Gain” function can automatically calculate the optimal gain values (to the maximum limit) for adjusted CSC and gradation values. Select all panels and click “Optimize gain” button after the CSC and gradation adjustment.

4.4.1.2. INSTALLATION

With remote control	Wallaby menu	Page
BLACK LEVEL	"Black Level"	44
WHITE BALANCE	"White Balance"	45
COLOR MATRIX:USER	"Color Matrix"	48
AMP GAIN	"Amp Gain" in "A/D Input Level"	48
SCALER AMP GAIN	"Scaler Amp Gain" in "A/D Input Level"	49
DIRECTION	"Direction"	42
FILTER TIME	Filter Time (*b)	84

(*b) The item with this mark is displayed in **Front** or when DIRECTION menu is set FRONT.



The main screenshot shows the Wallaby menu with the following sections:

- Maintenance:** Black Level
- Installation:** White Balance (Low, Middle, High), Tuning
- Misc. Func.:** Filter Time (4000)
- Color Matrix:** User Setting
- A/D Input Level:** Amp Gain, Scaler Amp Gain
- Direction:** Rear, Front (selected)
- Save** button

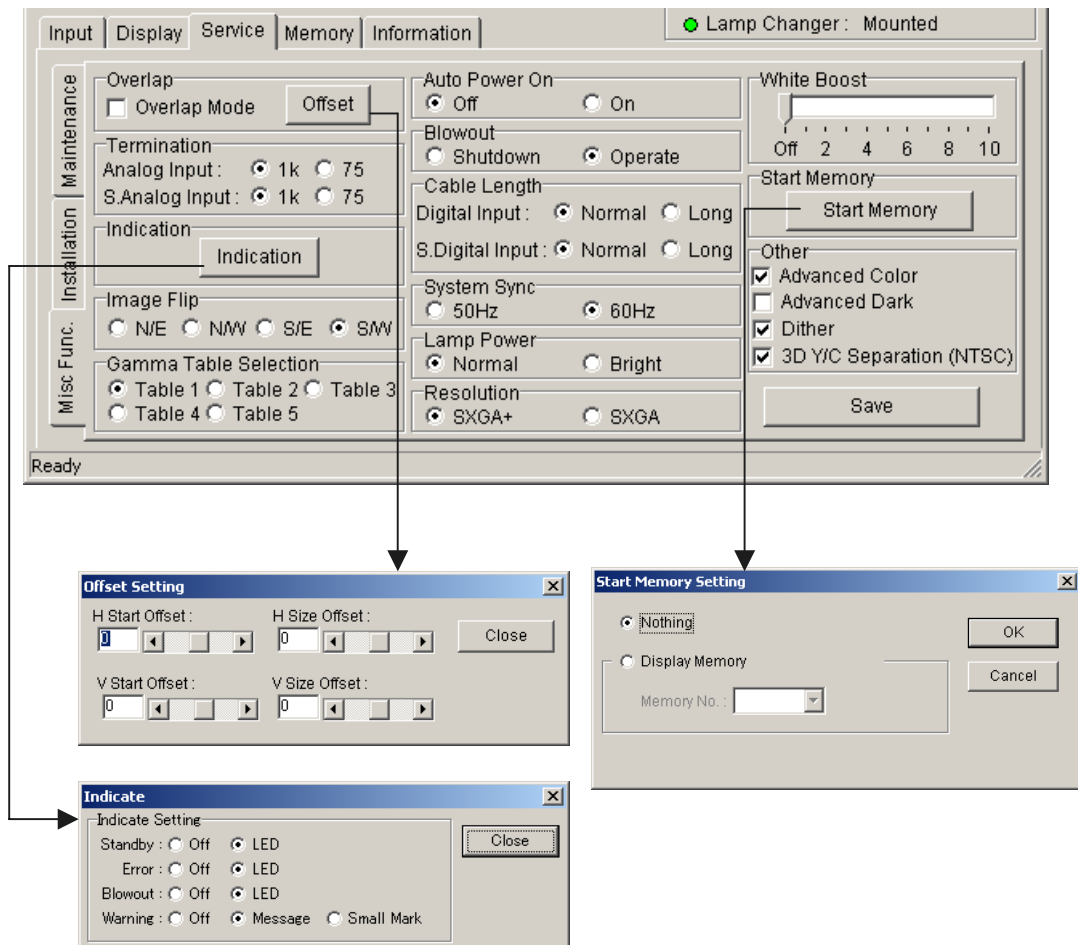
Sub-menu details:

- Black Level:** Red: 0, Green: 0, Blue: 0. Includes RGB Mute checkbox.
- White Balance:** Red: 100, Green: 100, Blue: 100. Includes Initialize button.
- Color Matrix User Setting:** Red: 0, Yellow: 0, Green: 0, Cyan: 0, Blue: 0, Magenta: 0, Saturation: 0. Includes Initialize and Close buttons.
- Input Level Setting (Base Input):** Gain (Base Input) and Level (Base Input) for Red, Green, Blue. Values are 127. Includes Auto Adjust, Initialize, and Close buttons.
- Input Level Setting (Option Input):** Gain (Option Input) and Level (Option Input) for Main, Red, Green, Blue. Values are 255. Includes Auto Adjust, Initialize, and Close buttons.

4.4.1.3. MISC FUNCTION

With remote control	Wallaby menu	Page
LAMP POWER	"Lamp Power"	37
LAMP MODE	"Lamp Mode" (for XL21)	37
TERMINATE	"Analog Input" in "Termination"	37
S.TERMINATE	"S.Analog Input" in "Termination"	37
ADV.COL	"Advanced Color"	49
ADV.DARK	"Advanced Dark"	49
GAMMA	"Gamma Table Selection"	49
DITHER	"Dither"	49
3D Y/C	"3D Y/C Separation (NTSC)"	50
START MEMORY	"Start Memory"	38
OVERLAP	"Overlap"	38
OFFSET	"Offset" in "Overlap"	38
BAUD RATE	(N/A)	39
SYSTEM SYNC	"System Sync"	39
IMAGE FLIP	"Image Flip"	39
INDICATION	"Indication"	40
WHITE BOOST	"White Boost"	50
AUTO POWER ON	"Auto Power On"	41
BLOWOUT	"Blowout"	41
EXTENDED ID	(N/A)	41
CABLE LENGTH	"Cable Length" (for PH50 and XL50)	42
RESOLUTION	"Resolution" (for PH50)	42

- The baud rate should be set with the remote control before RS-232 communication.
- The panel IDs can be set up to 64. If you set more than 33, the cube should be set that way in advance by the dipswitch and EXTENDED ID menu with the remote control.

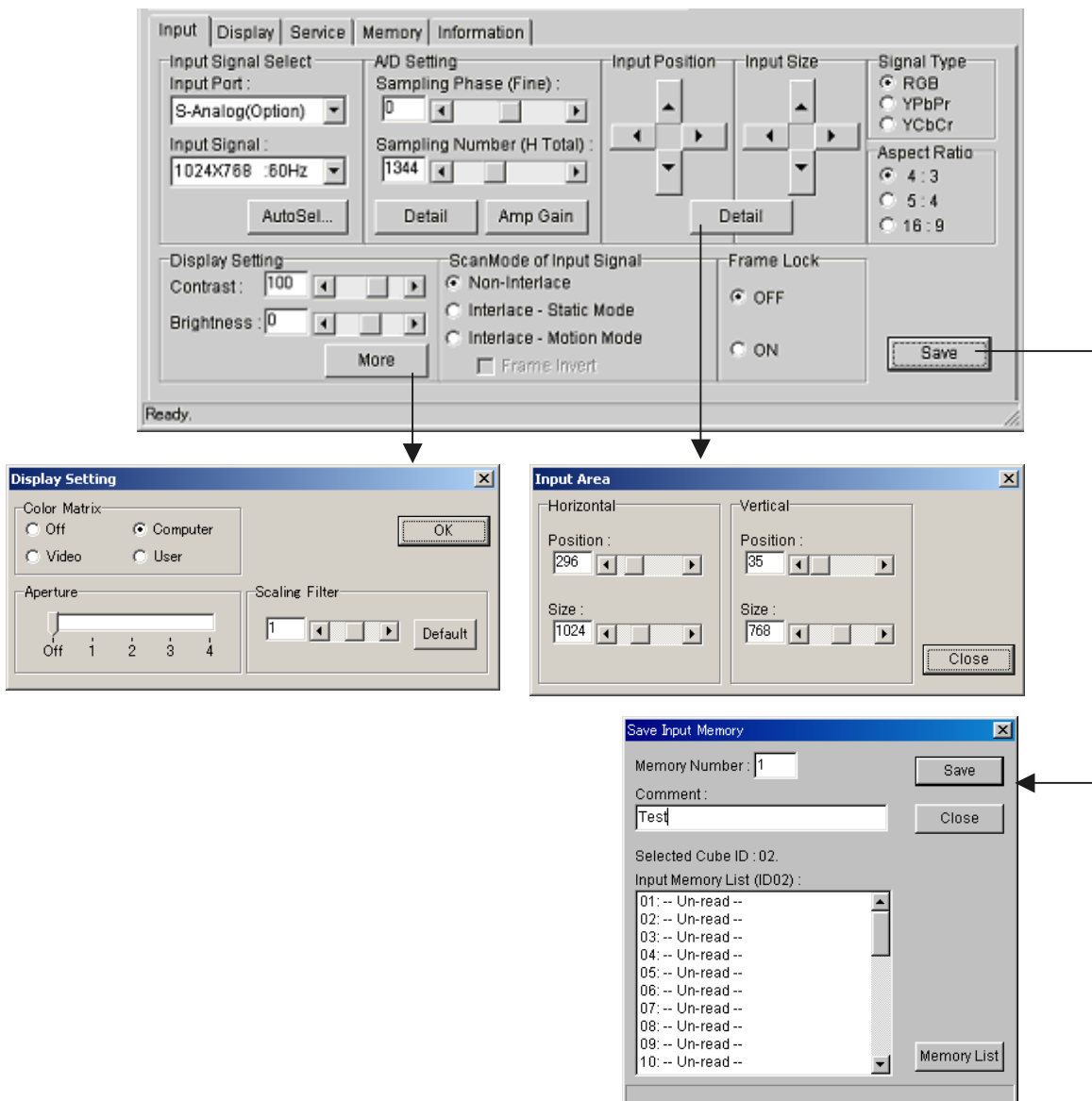


4.4.2. Input tab (for input memory)

When you exit the tab, click “Save” button surely to store the setting in each cube.

4.4.2.1. Common items

With remote control	Wallaby menu	Page
H.POSITION	“Input Position”	52, 58
V.POSITION		
H.SIZE	“Input Size”	53, 59
V.SIZE		
FRAME LOCK	“Frame Lock”	53, 60
SCAN MODE	“Scan Mode of Input Signal”	60
SIGNAL SELECT	“Input Signal” in “Input Signal Select”	53, 60
CONTRAST	“Contrast” in “Display Setting”	55, 63
BRIGHTNESS	“Brightness” in “Display Setting”	55, 63
COLOR MATRIX	“Color Matrix” in “Display Setting” window	55, 63
APERTURE	“Aperture” in “Display Setting” window	55, 63
ASPECT-RATIO	“Aspect Ratio”	64
SCALING FILTER	“Scaling Filter” in “Display Setting” window	55, 64
Automatic input signal scanning ([NORMAL] button)	“Auto Sel” in “Input Signal Select”	51, 57



The main interface shows the following settings:

- Input Signal Select:** Input Port: S-Analog(Optional), Input Signal: 1024X768 60Hz, AutoSel...
- AVD Setting:** Sampling Phase (Fine): 0, Sampling Number (H Total): 1344, Detail, Amp Gain.
- Input Position:** Crosshair controls, Detail.
- Input Size:** Crosshair controls, Detail.
- Signal Type:** RGB (selected), YPbPr, YCbCr. Aspect Ratio: 4:3 (selected), 5:4, 16:9.
- Display Setting:** Contrast: 100, Brightness: 0, More.
- Scan Mode of Input Signal:** Non-Interlace (selected), Interlace - Static Mode, Interlace - Motion Mode, Frame Invert.
- Frame Lock:** OFF (selected), ON.
- Save:** Button to save settings.

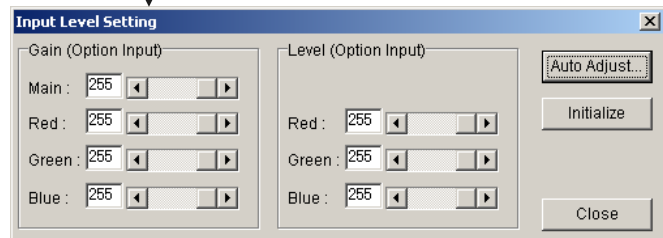
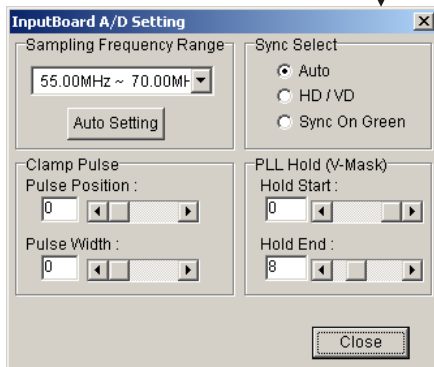
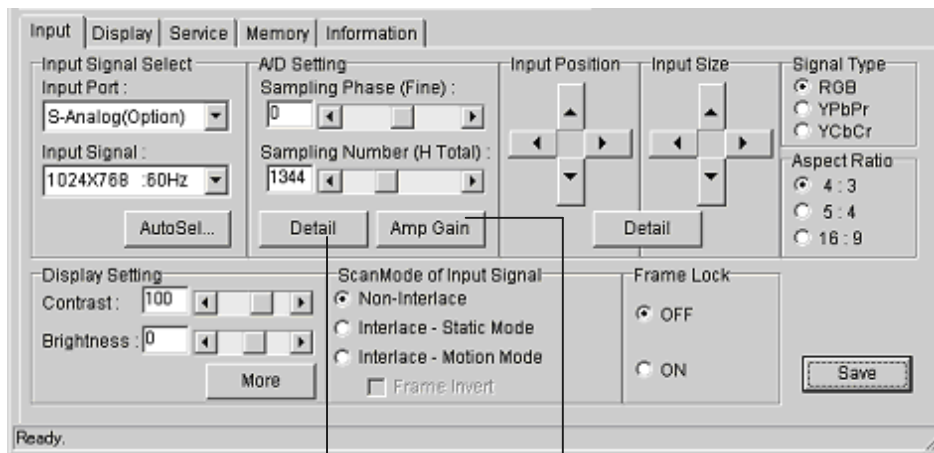
Display Setting Dialog: Color Matrix: Off, Computer (selected), Video, User. Aperture: Off, 1, 2, 3, 4. Scaling Filter: 1, Default.

Input Area Dialog: Horizontal: Position: 296, Size: 1024. Vertical: Position: 35, Size: 768. Close.

Save Input Memory Dialog: Memory Number: 1, Comment: Test, Selected Cube ID: 02. Input Memory List (ID02): 01: -- Un-read --, 02: -- Un-read --, 03: -- Un-read --, 04: -- Un-read --, 05: -- Un-read --, 06: -- Un-read --, 07: -- Un-read --, 08: -- Un-read --, 09: -- Un-read --, 10: -- Un-read --. Save, Close, Memory List.

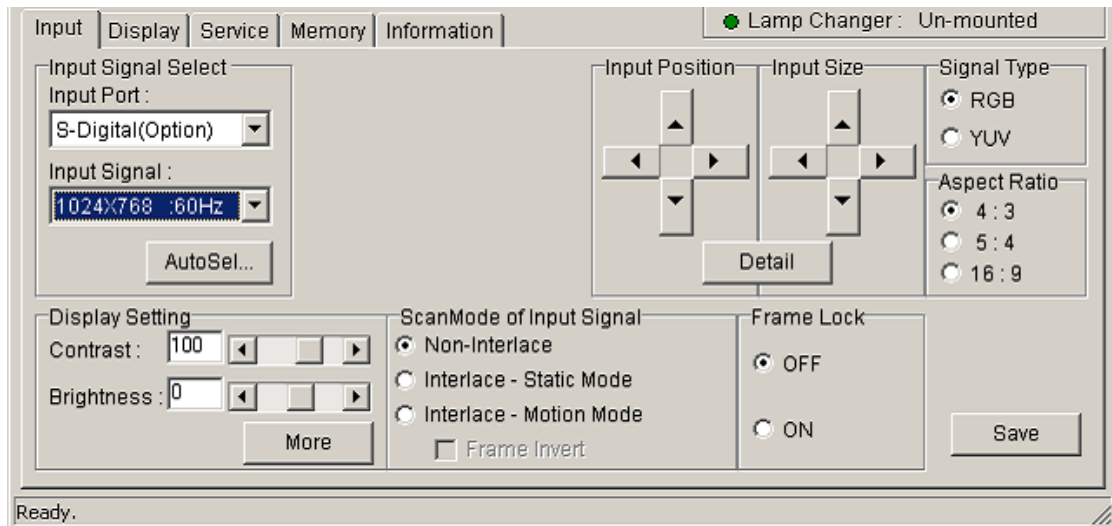
4.4.2.2. Additional items (When ANALOG or S.ANALOG is selected)

With remote control		Wallaby menu	Page
H.TOTAL		"Sampling Number (H Total)" in "A/D Setting"	53, 61
FINE		"Sampling Phase (Fine)" in "A/D Setting"	53, 58
CLAMP START		"Pulse Position" in "Clamp Pulse" in "A/D Setting" window	54, 61
CLAMP WIDTH		"Pulse Width" in "Clamp Pulse" in "A/D Setting" window	
MASK START		"Hold Start" in "PLL Hold (V-Mask)" in "A/D Setting" window	54, 61
MASK END		"Hold End" in "PLL Hold (V-Mask)" in "A/D Setting" window	
SYNC SELECT		"Sync Select" in "A/D Setting" window	54, 62
CLOCK RANGE		"Sampling Frequency Range" in "A/D Setting" window	54, 62
AMP GAIN	AUTO GAIN	"Auto Adjust..." in "Amp Gain" in "A/D setting"	52, 59
	MANUAL GAIN	"Gain" and "Level" in "Amp Gain" in "A/D setting"	
SIGNAL-TYPE		"Signal Type"	62



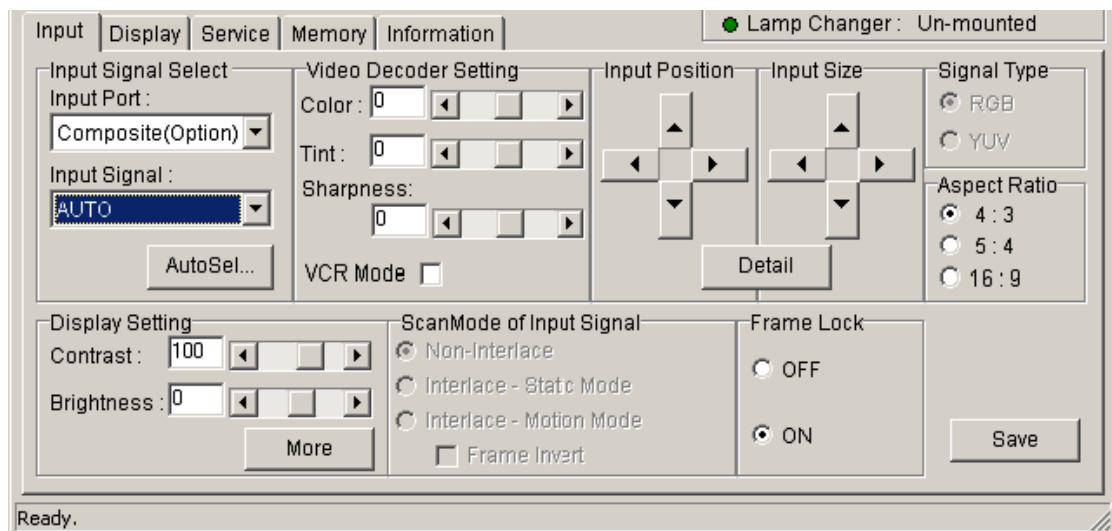
4.4.2.3. Additional items (When S.DIGITAL is selected)

With remote control	Wallaby menu	Page
SIGNAL-TYPE	"Signal Type"	62



4.4.2.4. Additional items (When COMPOSITE or Y/C is selected)

With remote control	Wallaby menu	Page
COLOR	"Color" in "Video Decoder Setting"	64
TINT	"Tint" in "Video Decoder Setting"	64
SHARPNESS	"Sharpness" in "Video Decoder Setting"	64
VCR MODE	"VCR Mode" in "Video Decoder Setting" (with VC-B20KV)	64

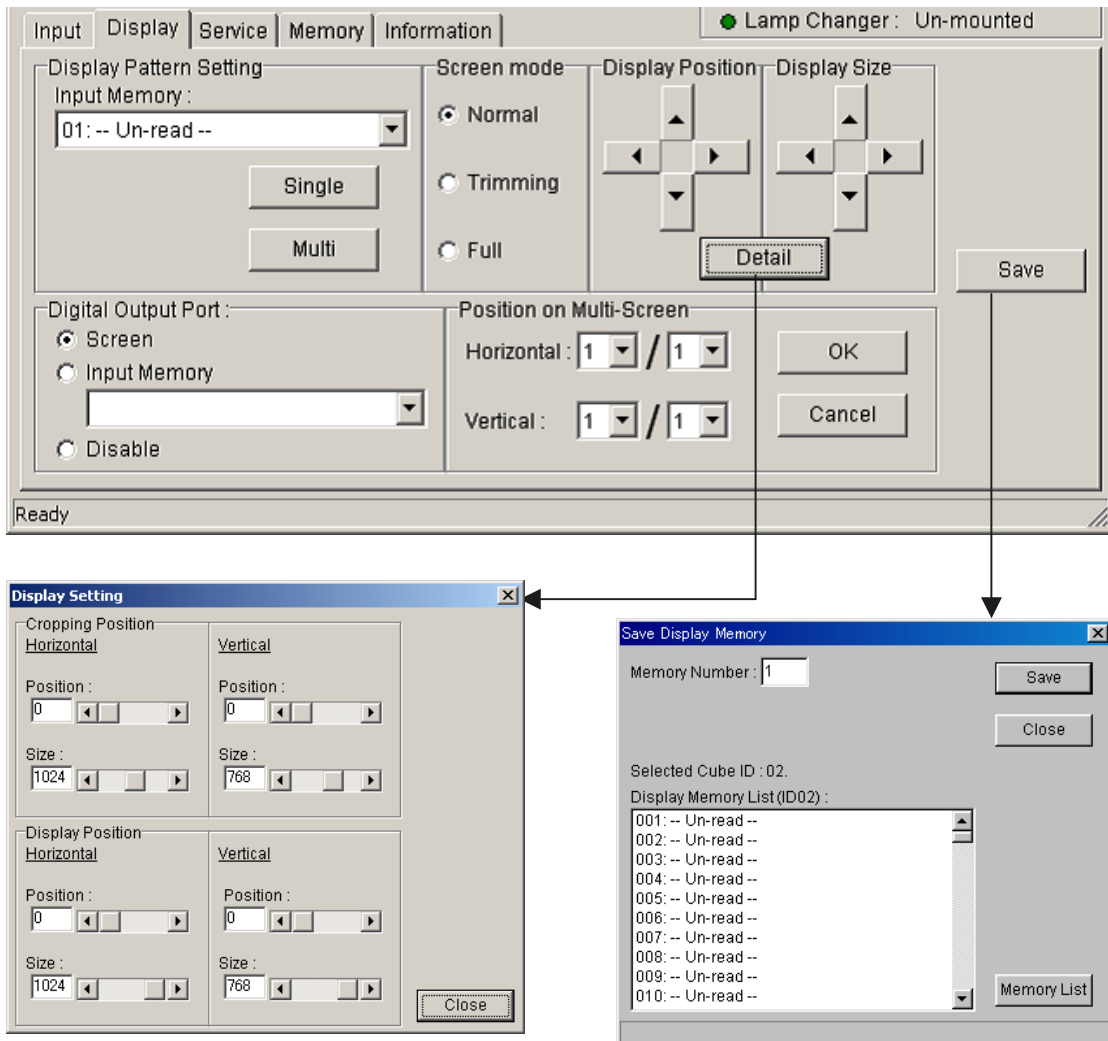


4.4.3. Display tab (for display memory)

When you exit the tab, click “Save” button surely to store the setting in each cube.

With remote control		Wallaby menu	Page
INPUT MEMORY		“Input Memory” in “Display Pattern Setting”	66
H.DISPLAY POS		“Position on Multi-Screen”	66
V.DISPLAY POS			
CROP	H.POSITION	“Crop Position” in “Display Setting” window	66
	V.POSITION		
	H.SIZE		
	V.SIZE		
DISPLAY	H.POSITION	“Display Position”	67
	V.POSITION		
	H.SIZE	“Display Size”	
	V.SIZE		
DIGITAL OUT		“Digital Output Port”	67
SCREEN MODE		“Screen Mode”	67

When you display an un-scaled image on each cube respectively, click “Single” button in “Display Pattern Setting”. When you display an enlarged image across the selected cubes, click “Multi” button. Displaying may take a while.



4.4.4. Memory tab

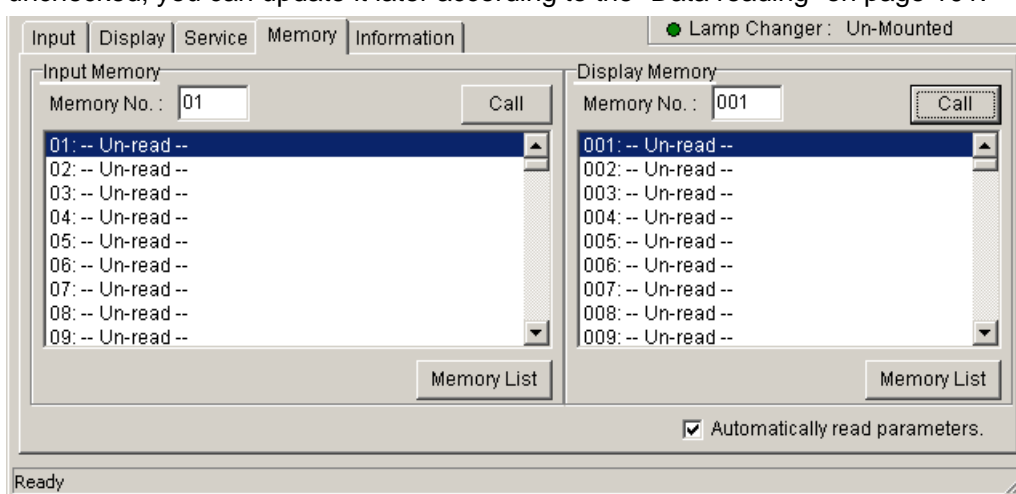
Registered memories can be called or deleted in the memory tab.

1. Select panels to call the memory.
2. Input a memory number to be called in “Memory No.” and click “Call” button.
Or you can also call it by double-clicking the memory number in the list box.

To delete a memory, select the memory in the list box and check “Delete” in the right-click menu.

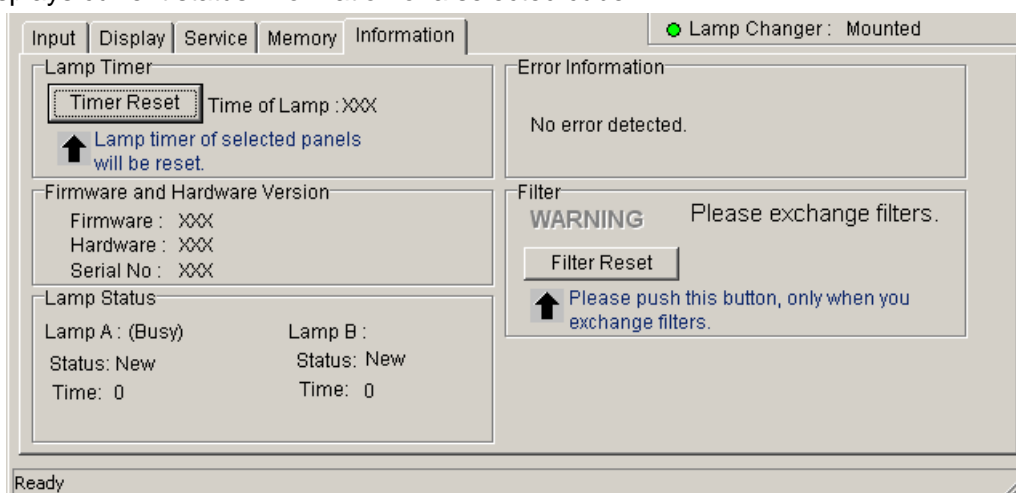
With remote control	Wallaby menu	Page
INPUT MEMORY	Input Memory	56, 65
DISPLAY MEMORY	Display Memory	68

- “Memory List” button can update the memory list.
- “Automatically read parameters” can automatically update the selected memory data in the software for synchronization with the cubes whenever you call the memory. Even if unchecked, you can update it later according to the “Data reading” on page 101.



4.4.5. Information tab

It displays current status information of a selected cube.

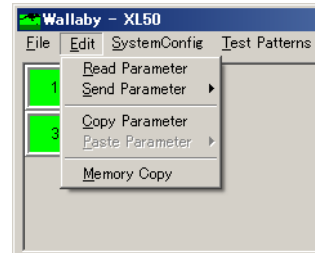


- “Timer Reset” button has the same function as “Reset” button in “Maintenance” in Service tab (on page 102).
- “Filter” menu appears only in **Front** or when DIRECTION menu is set FRONT. The filter used hours (on page 84) can be reset by the “Filter Reset” button.

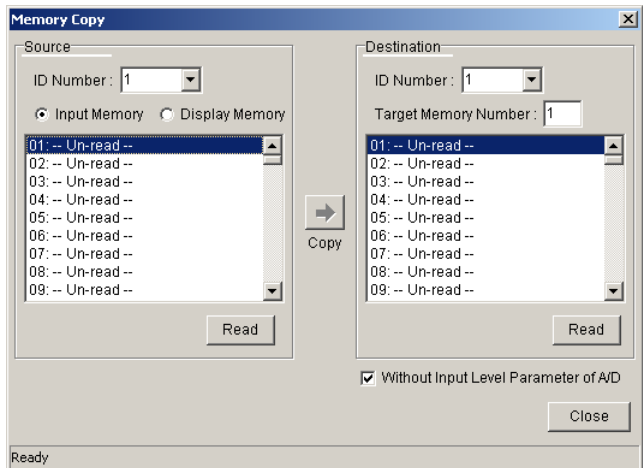
4.4.6. Memory copy

You can copy a registered input or display memory data to other memory numbers or other cubes.

1. Click “Memory Copy” in “Edit” menu. “Memory Copy” window comes up.



2. Input the original panel ID to be copied in “ID number” in “Source”.
3. Check “Input Memory” or “Display Memory” in “Source” to designate the memory to be copied.
4. Click “Read” button in “Source” to update the memory list synchronized with the cube data.
5. Select the memory to be copied in the memory list.
6. Input the destination ID in “ID number” in “Destination”.
7. Click “Read” button in “Destination” to update the memory list synchronized with the cube data.
8. Select the destination memory number in the memory list. Or input it directly in “Target Memory Number”.
9. Check or uncheck “Without Input Level Parameter of A/D”. You can choose to include AMP GAIN (on page 52 or 59) values in the copying data. Check it when you don’t include it.
10. Click “Copy” button.

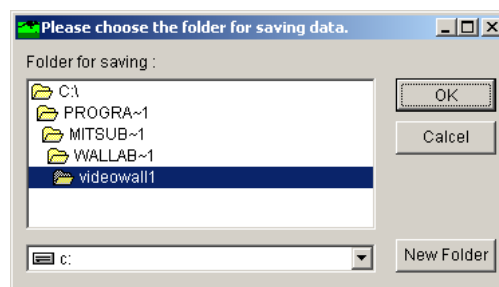
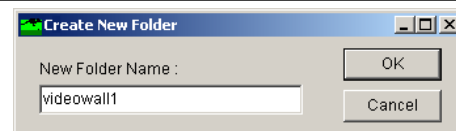
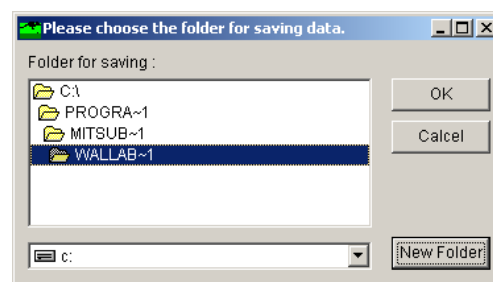
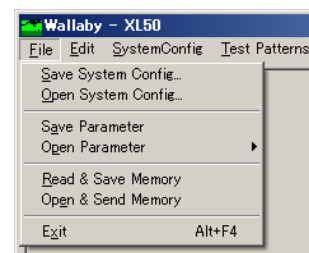
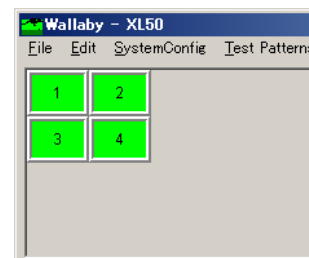


4.5. Memory backup

You can read all memory data in selected cubes to save in a designated folder. Also you can send it back to cubes.

4.5.1. Cube data saving

1. Select panels to read the data.
2. Click “Read & Save Memory” in “File” menu to display a folder-selecting window.
3. Click “New Folder” button to create a new folder to save the data in. Name an arbitrary folder name. If you choose an existing folder, the data in it will be overwritten.
4. Click “OK” button to start reading the cube data. It creates files with .bku extension in the folder. Each file contains each cube data.



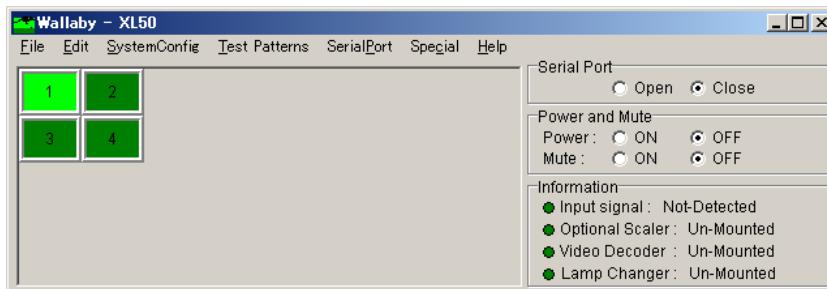
5. Wait until finishing. It may take a while depending on amount of registered data.



4.5.2. Data sending to cubes

1. Select “Open & Send Memory” in “File” menu to display the folder-selecting window.
2. Select the folder that includes the saved memory file.
3. Click “OK” button to start sending the memory data to cubes.
4. Wait until finishing. It may take a while depending on amount of registered data.

4.6. Main window



4.6.1. Panel selection area

Used to select panels to be controlled with clicking or dragging. Selected panels become bright to indicate active state. Previous selected panels become non-active. When you click a panel with pressing shift key, the previous selected panels remain the active state and new panel will be added on the state.

4.6.2. Serial Port

Used to switch open and close of a serial port in the control PC.

4.6.3. Power and Mute

Power: Used to turn on/off the power of active panels.

Mute: Used to switch picture mute of active panels.

4.6.4. Information

Input signal: Displaying whether an image signal is input to the selected cubes.

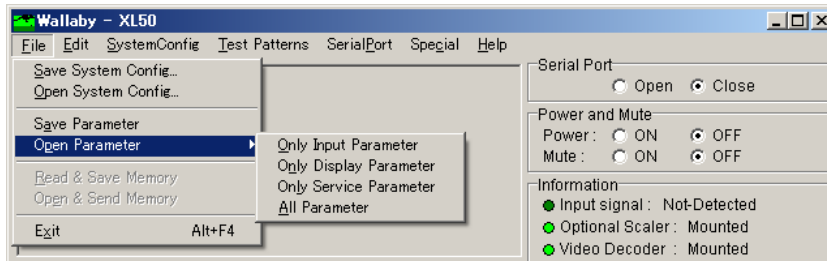
Optional Scaler: Displaying whether the optional RGB input board is mounted.

Video Decoder: Displaying whether the optional video input board is mounted.

Lamp Changer: Displaying whether the lamp changer unit is equipped.

4.7. Menu bar

4.7.1. File menu



4.7.1.1. Save System Config...

Used to save the current software configuration in a designated file. Name an arbitrary file name. It creates a file with .cfg extension that contains following items.

- Serial port number
- Communication speed
- Display wall configuration
- Panel ID numbers

4.7.1.2. Open System Config...

Used to configure the software according to the data saved in “Save System Config...” menu.

4.7.1.3. Save Parameter

Used to read all current memories in the software in selected panels to save in a file. Name an arbitrary file name. It creates a file with .wpd extension.

4.7.1.4. Open Parameter

Used to send the file data saved in “Save Parameter” menu to selected cubes. You can choose following options.

- Only Input Parameter : Sending only input memory data
- Only Display Parameter : Sending only display memory data
- Only Service Parameter : Sending only system memory data
- All Parameter : Sending all above memory data

4.7.1.5. Read & Save memory

Used to read all memory data in selected cubes to save in a designated folder (chapter 4.5.1, on page 112). Name an arbitrary folder name. It creates files with .bku extension in the folder.

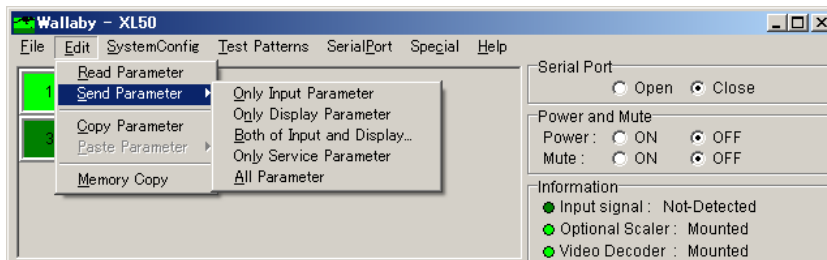
4.7.1.6. Open & Send memory

Used to send back the file data saved in “Read & Save memory” menu to cubes (chapter 4.5.2, on page 112).

4.7.1.7. Exit

Used to quit the software.

4.7.2. Edit menu



4.7.2.1. Read Parameter

Used to update the software data synchronized with selected cube data (chapter 4.3.8, on page 101).

4.7.2.2. Send Parameter

Used to send current memories in the software to selected cubes. You can choose following options.

- Only Input Parameter : Sending only input memory data
- Only Display Parameter : Sending only display memory data
- Both of Input and Display... : Sending both input and display memory data
- Only Service Parameter : Sending only system memory data
- All Parameter : Sending all memory data described above

Note: AMP GAIN (on page 52 or 59) values are not sent.

4.7.2.3. Copy Parameter

Used to copy current software memory data in selected panels to a clipboard. AMP GAIN (on page 52 or 59) values are not included.

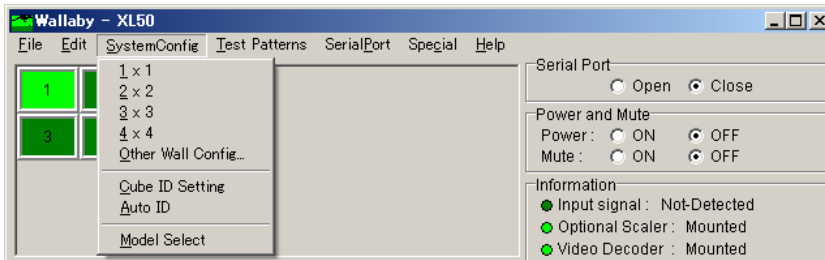
4.7.2.4. Paste Parameter

Used to send the memory data copied in "Copy Parameter" menu from the clipboard to selected cubes.

4.7.2.5. Memory Copy

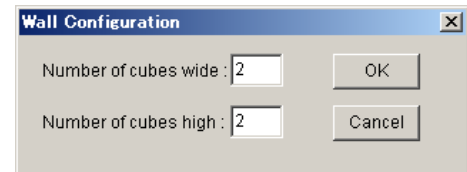
Used to copy a saved input or display memory data to other memory numbers or other cubes (chapter 4.4.6, on page 111).

4.7.3. System Config menu



4.7.3.1. **n by n (1x1, 2x2, 3x3 or 4x4)**

Used to select vertical and horizontal screen numbers in a display wall.



4.7.3.2. **Other Wall Config...**

Used to set the screen numbers in “Wall Configuration” window, except 1 by 1, 2 by 2, 3 by 3 or 4 by 4.

Note: Maximum number to be set is 64 screens.

4.7.3.3. **Cube ID Setting**

Used to set panel IDs manually in “Cube ID” window.

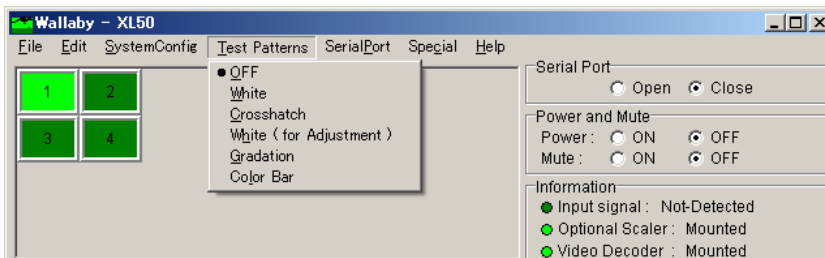
4.7.3.4. **Auto ID**

Used to allocate available ID numbers to the active panels automatically in a sequential order from the upper left cube.

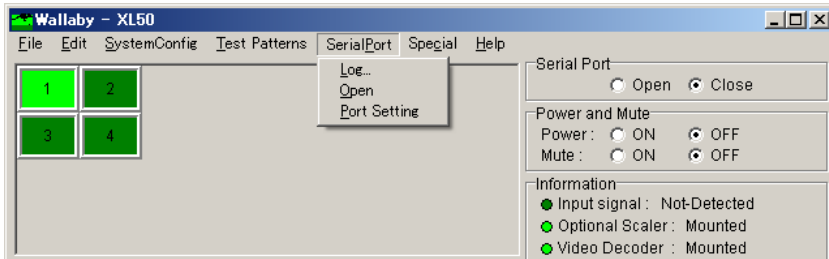


4.7.4. Test Patterns menu

Used to display test patterns. Selecting OFF stops the test pattern display.



4.7.5. Serial Port menu



4.7.5.1. Log...

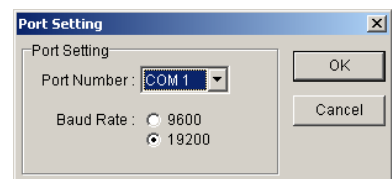
Used to display a communication log window.

4.7.5.2. Open

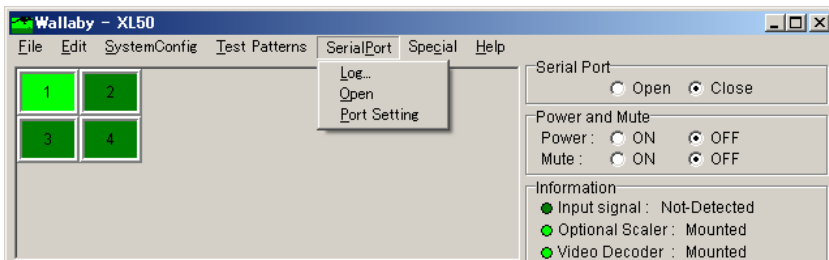
Used to switch open/close the serial port in the control PC.

4.7.5.3. Port Setting

Used to set the serial port in “Port Setting” window. The COM port number and the baud rate can be set.

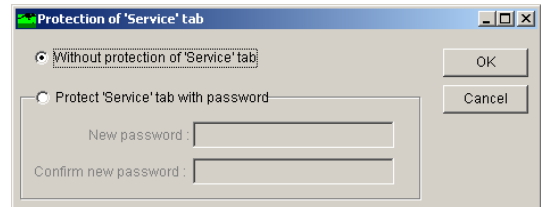


4.7.6. Special menu

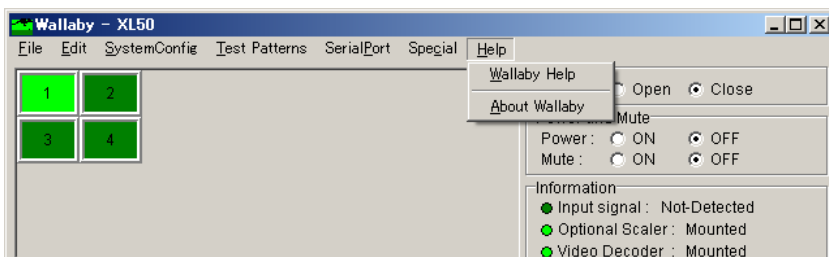


4.7.6.1. Protect Setting

Used to set a new password or invalidate the password for entering the Service tab in “Protection of ‘Service’ tab” window. If you don’t use the password protection in Service tab, check “Without protection of ‘Service’ tab”.



4.7.7. Help menu



4.7.7.1. Wallaby Help

Used to display the help file.

4.7.7.2. About Wallaby

Used to display the software version information etc.

5. About trademarks

DLP and the DLP medallion are trademarks of Texas Instruments.

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation in the United States and/or other countries.

The names of other products or companies mentioned are registered trademarks or corporate trademarks of the companies written herein.

6. Revision history

Description	Revision date
<ul style="list-style-type: none"> • Add product lineup, VS-67PH50U, VS-67XLWF50U and VS-67XLF50U. • In chapter 1.2.6.3.1, add the direction to block some vents in 50" Changer Front. • In chapter 1.5.1.15, add CUSTOM menu in CABLE LENGTH. 	March 09, 2007 (REV 2.4)
<ul style="list-style-type: none"> • Add product lineup, VS-50XLWF50U. • In chapter 1.8.2 and 1.8.4, add the notice of tweaking at an unmatched image linkage between screens. • In chapter 3.7, add several signals for VC-B50KA. 	November 06, 2006 (REV 2.3)
<ul style="list-style-type: none"> • Add product lineup, XL50 series. • In chapter 2.4.3.1, add the direction to check correct working of external AC fans when "CHECK FILTER" indication appears. • On page 17, change the condition of when to attach the optional AC fan. 	November 02, 2005 (REV 2.1)
<ul style="list-style-type: none"> • Add product lineup, VS-50PH50U and VS-67PH50U. • Add chapter 0, "External AC fan attaching". • Add chapter 1.5.1.17, "DIRECTION" menu. • Add chapter 4.3.1, "Model selecting". • Add chapter 4.4.6, "Memory copy". • Add chapter 4.5, "Memory backup". 	August 05, 2005 (REV 2.0)
<ul style="list-style-type: none"> • Add product lineup, VS-50XL21U, VS-67XL21U and VS-67XLW20U. • In chapter 3.5, add error code "2". • In chapter 3.8.1, add applicable products to motorized adjustment tool. 	September 03, 2004 (REV 1.7)
<ul style="list-style-type: none"> • In chapter 4, add explanation of new function in Wallaby version 2.1. (Up to 64 cubes can be controlled. Hot Exchange, Mechanical Alignment, Auto CSC, Filter Time and Filter Reset functions.) 	March 30, 2004 (REV 1.6)
<ul style="list-style-type: none"> • Add product lineup, VS-50XLF20U. • In chapter 1.4.1.3, add explanation of press-and-hold [R], [G], [B] button. • In chapter 1.4.2, change the function of dipswitch No. 2. • Add chapter 1.5.1.14, "EXTENDED ID". • In chapter 1.5.1.18, add "HOT EXCHANGE" menu. • Add chapter 4, "Adjustment software, "Wallaby"". • Add chapter 3.8, "Motorized adjustment tool specification". 	January 22, 2004 (REV 1.5)
<ul style="list-style-type: none"> • Add product lineup, VS-50XLW20U. • In chapter 2.2, delete the direction to set SENSOR OFF before condenser lens adjustment. • Add chapter 3.6, "Terminal functions". • Move "Connecting" to chapter 1.3. • In chapter 1.5.2.1, the value in WHITE BALANCE was "MIDDLE". • In chapter 3.2.1.1, the range of H.SIZE and V.SIZE were "640 – 1920" and "350 – 1200". 	October 10, 2003 (REV 1.4)
<ul style="list-style-type: none"> • In chapter 1.5.2.7, change the procedure of "Color balance readjustment after SENSOR RUN". • In chapter 3.2, add reference page in each menu item. • Separate "SYNC SELECT" from "CLAMP" as chapter 1.6.3.10. • In chapter 2.2, add the direction to set WHITE BOOST OFF before condenser lens adjustment. • In chapter 1.7.5.6, add the direction to set SCALING FILTER "0" when displaying high-resolution image. • In chapter 1.2.3, add the directions to turn off the main power switch and to stick the label. • In chapter 1.6.2, change the procedure of input signal selection. • In chapter 1.7.5.10, add VCR MODE menu. 	August 22, 2003 (REV 1.2)
Issue first edition (REV1.1)	July 04, 2003

